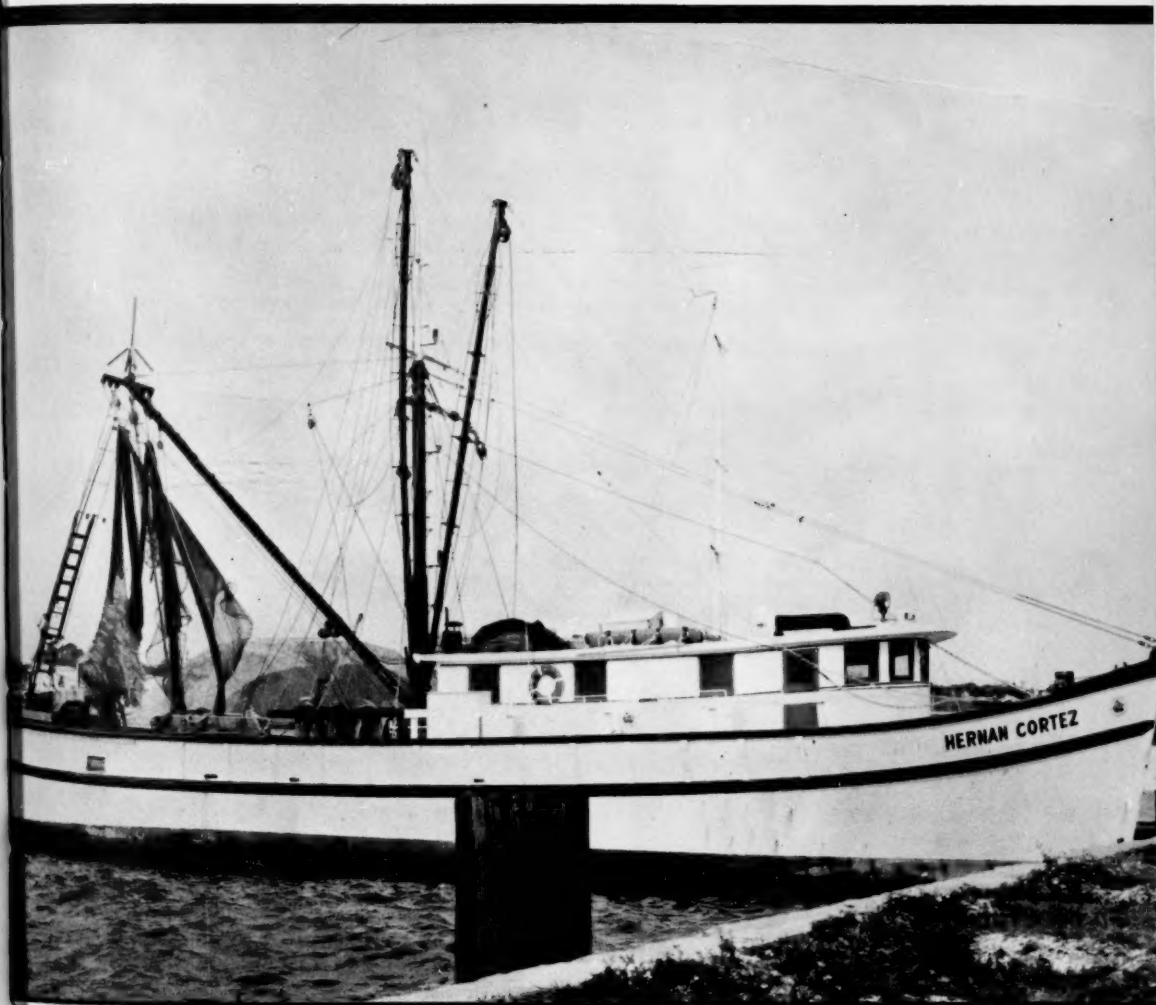


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COMMERCIAL FISHERIES REVIEW

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Fish and Wildlife Service
Bureau of Commercial Fisheries
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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
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EXPERIMENTAL FISH TRAWLING SURVEY ALONG THE FLORIDA WEST COAST

By Rolf Juhl*

ABSTRACT

At the request of industry, the U. S. Bureau of Commercial Fisheries and the Florida Board of Conservation made a bottomfish trawl survey along the west coast of Florida from April to July 1965. The main objective was to assess the trawl-fish potential of the area. Modified New England roller-rigged trawls 30 and 39 feet each were fished from the R/V Hernan Cortez. Although not conclusive, results from the 213 trawl stations did not show commercial concentrations of marketable bottomfish. Information on the gear used, catch composition, distribution, and station log data is included in the report.

INTRODUCTION

The fishing industry of the west coast of Florida depends on gill-net and hand-line fisheries for market fish. Gill nets are used mostly during the winter and spring, and hand lines throughout the year. During the summer an acute shortage of marketable fish forces many processors to cease operations for 3 to 4 months. At the request of several processors, the trawl-fish potential of the Florida west coast was surveyed during April to July 1965. The survey was a cooperative effort of the U.S. Department of the Interior's Bureau of Commercial Fisheries and the Division of Salt Water Fisheries, Florida Board of Conservation. Robert Ingle, Director of Research, Florida Board of Conservation, cooperated in the arrangements for use of the vessel, project objectives, and plans. The main aims of the survey were to determine the species composition, distribution, relative abundance, and availability to trawling gear of the bottomfish fauna in the 5- to 50-fathom depths between Panama City and Dry Tortugas. Field work was performed from April 29 to July 11, 1965.

VESSEL MATERIALS AND METHODS

The Florida Board of Conservation's R/V Hernan Cortez was used in the survey. This ship is a conventional, double-rigged shrimp trawler, built in 1964. The vessel has an overall length of 72 feet, a 20-foot beam and 7-foot draft. Propulsion is provided by a diesel engine developing 340 hp. at 1,800 r.p.m. The fish hold was converted to sleeping quarters for 6 persons with additional berths on the main-deck cabin for the captain and 2 crew members. Fuel and water capacities were sufficient for 3 to 4 weeks of continuous operation, but galley and food-storage facilities limited the sea time to 6 or 7 days. A triple-drum trawling winch was driven by a main engine power take-off. Capacity of the two drums is about 350 fathoms of $\frac{1}{2}$ -inch cable. Electronic equipment aboard the Hernan Cortez included a loran receiver, magnetic-compass automatic pilot, AM radio receiver and transmitter, and a 0-450 fathom depth-recorder. The double-rig deck arrangement (Knake, Murdock, and Cating 1958) permitted dragging a single net from either side or two nets simultaneously.

GEAR

The trawls were scaled-down versions of the New England trawls (Knake 1956). The bracket doors were standard 6 feet by $3\frac{1}{2}$ feet and $5\frac{1}{2}$ feet by $3\frac{1}{3}$ feet constructed of wood with steel bracing and runners (Captiva and Rivers 1959).

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Sep. No. 764

The 30-foot 4-seam fish trawl had a 30-foot 3-inch headrope and a 38-foot 7-inch footrope, and the net was of nylon. Wings, square, and bosom of the net were of 3-inch-stretched mesh, No. 30 thread nylon webbings.

Body of the net was of 2-inch-stretched mesh, No. 18 thread; funnel, 1½-inch-stretched mesh, No. 18 thread; intermediate, 1½-inch-stretched mesh, No. 36 thread and cod end, 1½-inch, stretched mesh, No. 36 thread.

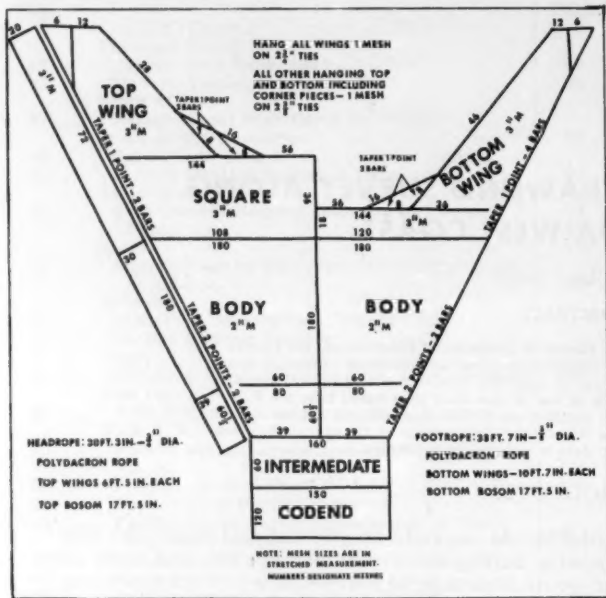


Fig. 1 - Diagram of 30-foot 4-seam fish trawl.

15 links. The "legs" between the net and doors were 5 fathoms long, with 1/8-inch wire cable on the headrope and 1/2-inch on the footrope. The bridles from bracket to warp, 1/2-inch wire rope, were 20 fathoms long.

The 39-foot 4-seam fish trawl had 40-foot 3-inch headrope and 48-foot 7-inch footrope.

The same size mesh, thread weight, and rope were used in this net as in the 30-foot net. The headrope was buoyed with 18 evenly spaced 4-by 8-inch plastic floats and two pairs of floats tied at midpoint; and the bosom section of the footrope was fitted with 15 wooden rollers and 1/4-inch chain in the same manner as the smaller net. A "kite" or rising-panel device to prolong the life of the headrope proved unsatisfactory because of excessive tangling during "shooting" operations.

OPERATION

Except for minor modifications, the roller-rigged fish trawls were

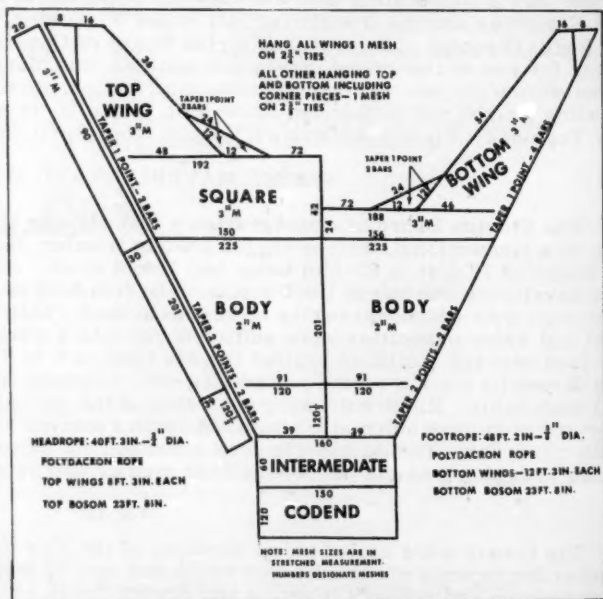


Fig. 2 - Diagram of 39-foot 4-seam fish trawl.

handled like standard double-rigged shrimp trawls (Knake, Murdock, and Cating 1953). The best towing speed was $2\frac{1}{2}$ knots with the engine turning 1,250 r.p.m. when using two nets, and 1,150 r.p.m. during single-net operation. A ratio of 3:1 of towing warp length to water depth was used normally, but increased to 4:1 when fishing shallower depths.

The rugged doors, heavy twine, and roller rig were used because broken bottom, coral reefs and loggerhead sponge areas characterized much of the area surveyed. Tears and hang-ups were frequent but damage to the gear was not excessive. The same nets were used throughout the entire survey. In gear evaluation studies a single net was fished with the rollers attached directly to the footrope, without spacers. Results indicated that spacers are a desirable feature in reducing bottom debris in the catch, especially cumbersome loggerhead sponges and coral.

The Hernan Cortez followed a transect course with trawl stations every 10 miles, and deviations from the track were made when echo-sounder tracings showed bottom configuration unsuitable for trawling. Drags were repeated in areas of large catches. Trawls were operated between 6 a.m. and 10 p.m., completing 5 to 7 drags per day. Trolling lines were fished whenever possible, fish traps set while at anchor, bridge lookout for surface schools maintained during daylight hours, and routine meteorological and water temperature data recorded at each station.

Port calls were made in Cedar Keys, Panama City, St. Petersburg, Fort Myers, and Fort Myers Beach, to unload fish and replenish supplies.

RESULTS

The main purpose of the survey was to explore for concentrations of fishes with commercial potential so data presented are limited to catches of over 5 pounds of a species from a single drag. A station summary, listing the total weight of fish per drag and significant species, is included in the appendix¹.

The most productive depths were 21 to 30 fathoms both north and south of Tampa Bay. This depth band coincided with the heaviest loggerhead sponge concentrations, especially south of Tampa Bay where one net produced over a ton of loggerheads during a 45-minute drag. Similar conditions were found earlier during the R/V Oregon shrimp explorations (Springer and Bullis 1954).

The largest fish catch, 525 pounds, consisted mostly of nonfood species. The least productive drags were made in 40 to 50 fathoms north of lat. $28^{\circ}28'$ N. and at all depths fished south of lat. $26^{\circ}30'$ N.

Of the 210 hauls that caught fish, 94 were made with double trawls and 116 with a single trawl. The average fish catch per single trawl was 23 pounds and for double trawl 105 pounds.

Five species of snapper were caught with vermilion snapper taken most frequently. Snapper were caught in 150 drags in depths over 10 fathoms. Red grouper, the most common of the five grouper species, were caught in all but the 30-40 fathom depth range.

Black sea bass were common in 5- to 10-fathom depths from Tampa Bay to Cape San Blas and rare in deeper water. The black sea bass appeared more often in drags deeper than 20 fathoms, from Tampa Bay southward.

Sixteen species of commercial interest (fish weighing over $\frac{1}{2}$ pound each) were caught. Selectivity of the gear, its small size, and relatively slow towing speed precluded capture of some large species.

Invertebrates of commercial interest included the Spanish lobster (bulldozer), which was captured at 59 trawl stations. Although present at all depths, it was taken more frequently in 20 to 30 fathoms between Tampa Bay and Fort Myers Beach. As many as five

¹/Appendix is available with reprint of this article (ask for Separate No. 764).

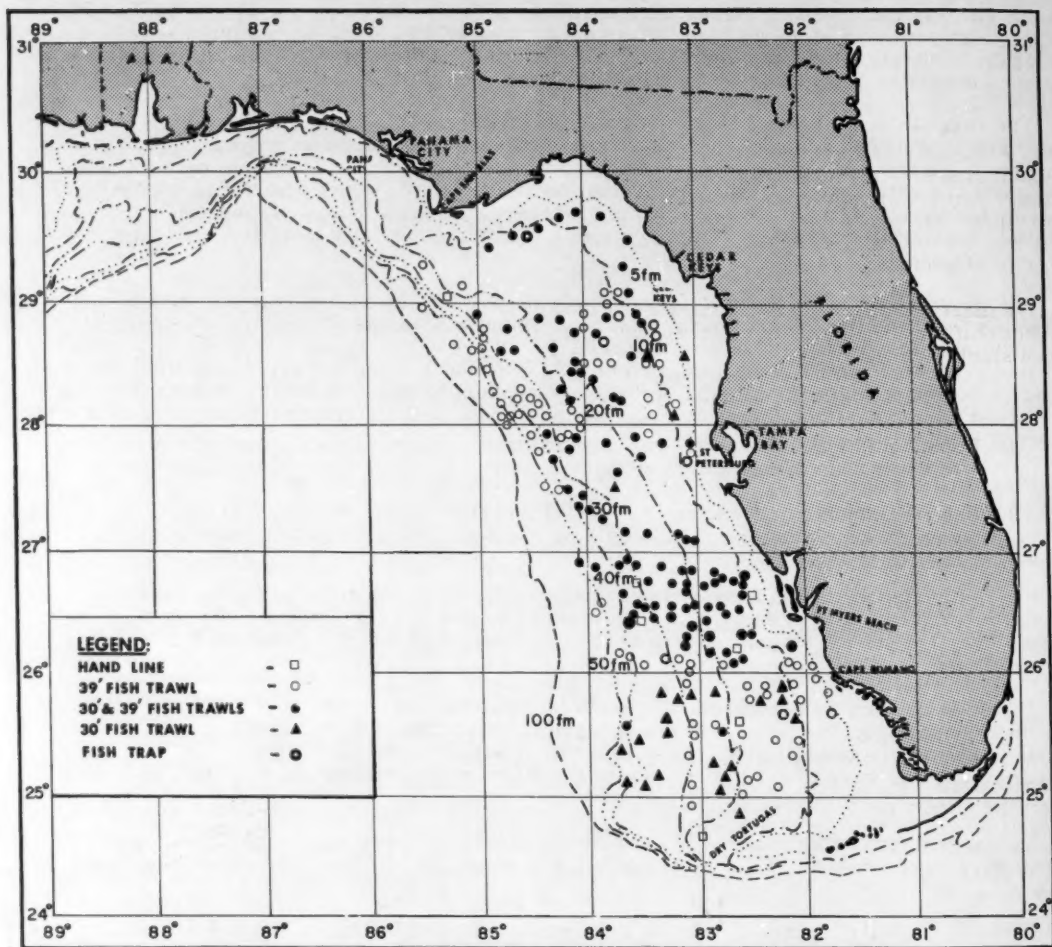


Fig. 3 - The survey fishing stations of the R/V Herman Cortez.

were taken in a single drag, and the largest single specimen weighed 2 pounds. Night fishing produced only small numbers of pink and rock shrimp.

GENERAL NOTES

Surface schools of fish were observed frequently inside the 10-fathom contour, with greatest concentrations near Cape San Blas, Tampa Bay, Fort Myers Beach, and Cape Romano. Between Cape St. George and San Blas 18 to 20 schools, containing 8 to 10 tons each, of round scad (*Decapterus* sp.) were observed. Off Tampa Bay round scad and Spanish sardines (*Sardinella anchovia*) were found, each in schools of 3 to 5 tons. Spanish sardine schools of 2 to 4 tons predominated off Fort Myers Beach and Cape Romano. From Cape Romano southward the dominant species was thread herring (*Opisthonema* sp.) in schools of 2 to 10 tons; 12 to 14 schools could be observed at one time, usually in depths less than 10 fathoms. Little tuna (*Euthynnus alletteratus*) were seen in varying numbers throughout the study areas from Cedar Keys to Dry Tortugas, with heavier concentrations south of Fort Myers.

Trolling lines fished between stations produced little tuna, king mackerel, and Spanish mackerel. Weather during the survey was excellent with only 1 day of fishing time lost because of rough seas.

CONCLUSIONS

Although the survey trawls were smaller than typical commercial gear, catch composition proved fishing capability equal to shrimp trawls and demonstrated that roller-rigged fish trawls can be fished without excessive damage in areas unsuitable to conventional shrimp trawling. This type of fish trawl can be adapted for use on standard double-rigged and single-rig shrimp boats. In addition to preventing excessive trawl damage, rollers help considerably in avoiding undesirable bottom detritus.

Except for a few marginal catches, the survey did not show commercial concentrations of bottomfish. The catch per net was more than twice as productive on double-trawl drags than single-trawl drags.

RECOMMENDATIONS

1. Repeat this type of survey over the same and adjoining areas during fall and winter to determine changes in availability and composition of the bottomfish fauna.
2. Use fish-finding echo-sounders, preferably the "white line" type, in future surveys. Concentrations of fish could be located more readily and effectively fished.
3. Try larger trawls of 50- to 60-foot headrope length, and near-bottom midwater trawls in the 20-30 fathom depth to obtain some commercial measure of the available bottomfish stocks.

APPENDIX

A detailed appendix includes: Table 1 - Species Composition by 10-Fathom Intervals from Panama City to Tampa Bay; Table 2 - Species Composition by 10-Fathom Intervals from Tampa Bay to Dry Tortugas; Table 3 - Species Composition by One Degree Latitude from Panama City to Dry Tortugas; Table 4 - List of Species Referred to in Fishing Log of R/V Hernan Cortez, April 29-July 11, 1965 (213 Drags); Table 5 - Fishing Log of R/V Hernan Cortez, April 29-July 11, 1965. Appendix appears in Separate No. 764 of the article. For a free copy of the Separate write to Publications Office, U. S. Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Washington, D. C. 20240.

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TRENDS AND DEVELOPMENTS

Alaska

USDI INSPECTION OF HERRING-EGGS-ON-KELP:

Food scientists of the Bureau of Commercial Fisheries, U. S. Department of the Interior, made in April 1966, the first USDI fishery product inspection in Alaska, announced the Bureau's Technological Laboratory at Ketchikan. The product inspected was herring-eggs-on-kelp, a product which has only recently been commercially harvested in Alaska. The herring-eggs-on-kelp were purchased by a United States firm for consignment to a Japanese firm in New York and required an inspection certificate as to quality as a condition of sale. The eggs were to be exported for consumption in Japan.

Herring spawn in large schools releasing their eggs and milt into the water en masse. They spawn in local areas along the Alaska coastline. The eggs contain a glue-like substance that causes them to stick to the bottom or to any growth over the bottom. Herring-eggs-on-kelp result from a small proportion of the spawn that attaches to a special type of large seaweed that belongs to the group of brown algae. In Alaska, the kelp and herring spawning occur together at Fish Egg Island near Craig, and on beaches near Hydrburg and Sitka.

Herring-eggs-on-kelp is a unique product and the USDI inspector was faced with some unusual problems. The primary concern of the Japanese buyer was that the cover of eggs on the kelp was sufficient. He specified that it was to exceed 350 eggs per square inch. The egg cover was estimated by first determining the number of eggs per gram by counting accurately weighed samples. Samples of kelp from the lot were then measured for area and the eggs stripped from these measured areas were accurately weighed to calculate egg cover.

Interior's USDI voluntary Inspection Service provides an impartial, official inspection

service for processed fishery products. It is administered by the Bureau of Commercial Fisheries and is available on a fee-for-service basis to anyone who has financial interest in the fishery product involved.

PEELABILITY OF FRESH PINK SHRIMP DISCUSSED:

A member of the U. S. Bureau of Commercial Fisheries Ketchikan Technological Laboratory presented in Seattle during March a special demonstration cutting of canned shrimp to about 25 industry, Bureau, and National Canners Association technologists. Generally, the group was favorably impressed by the quality of the shrimp peeled "fresh" after short heat treatments instead of aging to loosen the shells. Color, flavor, texture, and possible yield are improved by the new process. The consensus seemed to be that progress is being made. The next step needed is commercial-scale production using the new process to determine its economics. Industry technologists did not seem particularly concerned about the gelling typical of shrimp peeled fresh and then heat processed.



Alaska Fishery Investigations

EARLIER RED SALMON EGGS REQUIRE THE MOST THERMAL UNITS:

Studies of the embryological development of eggs collected from the three spawning waves of Brooks River sockeye are showing that eggs from the earliest wave require the greatest number of thermal units to hatching while eggs from the latest wave require the least number of thermal units. The thermal regimen for eggs of each wave of spawning sockeye is different. Experiments have been designed and tests will be made for both genetic and environmental influences as they may affect the Brooks River sockeye to dis-

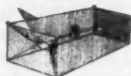
cover whether or not the separate waves of spawners are distinct genetic stocks.

SPAWNING CHANNEL PINK FRY SURVIVAL ENCOURAGING:

Results at Little Port Walter, after sampling fry in the streambeds in Sashin Creek and Lovers Cove, were to be summarized in April 1966 by Bureau scientists. However, the overwinter survival appears to have been as good in the newly constructed spawning channel in Lovers Cove as in the natural gravel beds in Sashin Creek. Since the gravel in the channel will not be graded and cleaned of silt and organic debris until this summer, this preliminary egg survival test indicates that the channel will be a good testing site for future experiments. The channel survived the winter weather in excellent shape.

SHRIMP BEHAVIOR STUDIES CONTINUED:

Shrimp behavior trap studies at Little Port Walter were continued in March 1966. Shrimp were readily available during the month, providing a steady supply for aquarium studies. Bureau gear research scientists and divers from the Auke Bay Biological Laboratory spent a week observing the distribution of shrimp in the bay and their reactions to traps.



American Samoa

TUNA FLEET STATUS, JANUARY 1966:

A total of 104 foreign tuna fishing vessels (40 Japanese, 38 South Korean, and 26 Formosan) was fishing out of American Samoa in January 1966. In September 1965, 58 Japanese, 27 South Korean, and 11 Formosan vessels were fishing out of American Samoa. While the number of Japanese vessels has declined, there has been a sharp increase in South Korean and Formosan vessels. (*Suisan-cho Nippo*, March 4, 1966, and other sources.)



California

EXPERIMENTAL ANCHOVY FISHERY AS OF APRIL 20, 1966:

California's anchovy reduction fishery in Zone 2 (the area between San Pedro and Catalina) was expected to reach its 10,000-ton quota before the end of April 1966, and was scheduled for closure at midnight, April 26, according to the California Department of Fish and Game. However, catches in the other four zones were relatively light and closure of those zones was not anticipated before the overall season ended on April 30. The total catch for all five zones was 11,801 tons as of April 20, out of a total quota of 75,000 tons.

The regulations adopted by the California Fish and Game Commission provided that the Director of the Department of Fish and Game shall terminate the fishery in any zone if the zone reaches its quota before the overall season ended.

Through April 21, a total of 8,551 tons had been landed in Zone 2. Landings for the four previous days were 5 tons April 17, no landings on the 18th or 19th, and 352 tons on April 20. When the April 20 landings were completely tallied on April 21, it was decided to give the legally required five days notice to terminate the fishery in Zone 2, because of the possibility that the quota of 10,000 tons might be reached by April 26.

The Zone 2 area extends from Port Hueneme on the North to Dana Point on the South and reaches out to sea as far as Catalina Island. No anchovy reduction fishing was allowed within three miles of the mainland shore or the mainland side of Catalina Island. Most of the fishing effort was in that zone, because of its nearness to the majority of the fishing fleet and processing plants.

Through April 20, quotas and landings in the five zones were: Zone 1 (Point Conception to Port Hueneme) 10,000-ton quota, 811 tons landed; Zone 2, 8,324 tons landed; Zone 3 (Dana Point to the Mexican border) 10,000-ton quota, 930 tons landed; Zone 4 (the entire open ocean area west of Catalina and the Santa Barbara Islands) quota 35,000 tons, 1,402 tons landed; Zone 5 (from Point Conception North) 10,000-ton quota, 334 tons landed. (California Department of Fish and Game, April 23, 1966.)

ANCHOVY TAGGING PROGRAM CONDUCTED:

Nearly 15,000 anchovies were tagged and released by marine biologists of the California Department of Fish and Game during March-April 1966 in a tagging program designed to obtain vital information on anchovy movement, mortality, and commercial catch results.

The tagging program was conducted in connection with the experimental anchovy reduction fishery authorized by the California Fish and Game Commission which was scheduled to end on April 30, 1966.

When the anchovies are caught by commercial fishermen and taken to a reduction plant for grinding into fish meal, magnets on the reduction line pick up the metal tags and make it possible to recover them.

As of mid-April, a total of 7,990 anchovies in the $4\frac{1}{2}$ -to $6\frac{1}{2}$ -inch size range had been tagged in the San Pedro area and released into the ocean in various spots outside Los Angeles Harbor. Another 6,992 anchovies were similarly tagged off Port Hueneme and released in the same area.

About 60 tags had been recovered by the middle of April. Data from these tags was being analyzed, but State biologists reported that the tagged fish were caught in the approximate areas of release.

The tagging program was to continue, with hopes that about 100,000 anchovies would be tagged and released in 1966.



Cans--Shipments for Fishery Products, January 1966



A total of 123,973 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January 1966 as compared with 178,968

base boxes used during January 1965.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area of 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.7 base boxes per short ton of steel.

Source: U.S. Department of Commerce, Bureau of the Census.

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Central Pacific Fisheries Investigations

HUGE SKIPJACK TUNA POTENTIAL SEEN:

There are at least enough skipjack tuna in the eastern half of the Pacific Ocean to come near to doubling the entire present United States tuna catch, and possibly much more. That was one of the chief conclusions of a Governor's Conference on Central Pacific Fishery Resources, held in Honolulu and Hilo, Hawaii, February 28-March 11, 1966, at the invitation of Governor John A. Burns of the State of Hawaii.

The conference was sponsored by the Hawaii Department of Planning and Economic Development, the Hawaii Department of Land and Natural Resources, the U.S. Bureau of Commercial Fisheries, and the Department of Economic Development of Hawaii County.

Divided into three sessions, the conference first saw a group of biologists weigh the evidence on the abundance of skipjack, yellowfin, and big-eyed tuna. Next, the findings of the scientists were discussed with industry representatives and government officials. On the last day of the conference the group reported to the public on its findings.

The conference participants agreed that the Pacific holds enormous stocks of skipjack tuna. A minimal estimate of the potential annual yield for the eastern half of the Pacific was 100,000 tons. The conference stressed that this was probably a very low figure, and said that the true magnitude of the skipjack tuna resource cannot as yet be estimated, because of a lack of adequate data.

Locating and catching the skipjack of the central Pacific present great technical problems, however. The fish are found in an area about 10 times the size of the continental United States. Schools of young skipjack appear along the margins of the Pacific, and skipjack of all age groups near Hawaii and in various other island groups. Surface schools of skipjack, however, are only infrequently seen in the open seas.

Studies of the distribution and behavior of subsurface tuna with sonar and the modification or design of appropriate gear were seen as requisites to the harvest of these resources.

As for the Hawaiian fishery, the conference recommended that purse seining again

betried in Hawaiian waters. Experiments in 1950 and 1951 suggested that the method was not profitable in Hawaii, but there have been so many developments in purse seining since then that the conferees thought it worthwhile to make new tests.

Although strongly emphasizing the potential of the skipjack tuna fishery, the conference also considered the possibilities of two other fisheries, those for yellowfin and big-eyed tuna. Estimates of potential catch of the yellowfin were placed at an increase of 30,000 to 50,000 metric tons over the present Pacific long-line catch of 100,000 tons (exclusive of the eastern Pacific fishery area). Little increase in the present long-line big-eyed catch of 100,000 tons was seen as possible.

Cited as one of the chief scientific problems facing tuna research was that of establishing the identity of subpopulations of the various species. The U.S. Bureau of Commercial Fisheries Biological Laboratory in Honolulu has developed techniques to distinguish between subpopulations of skipjack tunas. So far, these have shown that there are at least two such subpopulations present in the Hawaiian fishery.

The Proceedings of the Conference will be published by the State of Hawaii. They will consist of two volumes, the first of which will contain the reports of the five working Groups on Skipjack Tuna, Yellowfin Tuna, Big-eyed Tuna, Gear Development, and Research Program. The second volume will carry a group of background papers, prepared primarily by members of the staff of the Bureau's Laboratory in Honolulu, dealing with tuna problems. The volumes should be published later this year.

OCEANOGRAPHIC RESEARCH PROJECT CONDUCTED SOUTH OF THE HAWAIIAN ISLANDS:

M/V "Townsend Cromwell" Cruise 20
(October 22-November 15, 1965): To study the wake system downstream of the Hawaiian Islands, locating the major eddies that make up this system and determining their apparent origin while studying the changes in salinity and temperature distributions in the area of the wake, was the principal objective of this cruise by the research vessel Townsend Cromwell. The vessel is operated by the U. S. Department of the Interior's Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The area of

operations was south of the Hawaiian Island chain, within the area bounded by latitude 16° N. to $21^{\circ}30'$ N. and longitude 156° W. to 162° W. (fig. 1).

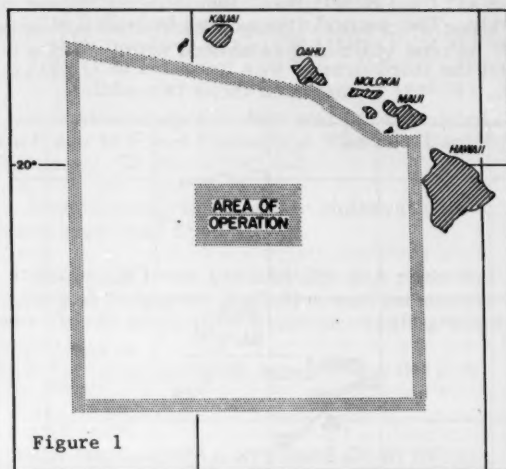


Figure 1 - Area of operation, Townsend Cromwell, Cruise 20 (October 22-November 15, 1965).

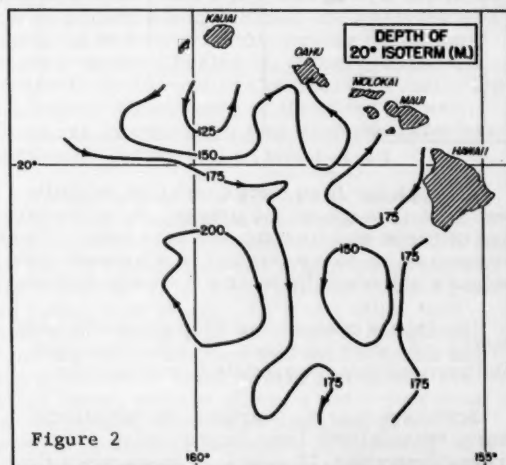


Figure 2 - Location of anticyclonic eddies.

During the cruise 4 eddies were located by bathythermographs and the STD; their thermal structure was studied. Two cyclonic eddies were present with their centers at $21^{\circ}10'$ N., $158^{\circ}40'$ W. and 18° N., $157^{\circ}10'$ W. Two anticyclonic eddies were also present with their centers at $19^{\circ}50'$ N., $156^{\circ}40'$ W., and 18° N., $159^{\circ}30'$ W. (fig. 2).

After completing the preliminary survey, the pair of anticyclonic and cyclonic eddies nearest the island of Hawaii were studied. The first parachute drogue was launched at $19^{\circ}41' \text{ N.}$, $156^{\circ}36' \text{ W.}$ in the anticyclonic eddy. The second drogue was launched at $18^{\circ}13' \text{ N.}$, $157^{\circ}41' \text{ W.}$ in the cyclonic eddy, and the third drogue was launched at $18^{\circ}51' \text{ N.}$, $157^{\circ}17' \text{ W.}$ between these two eddies.

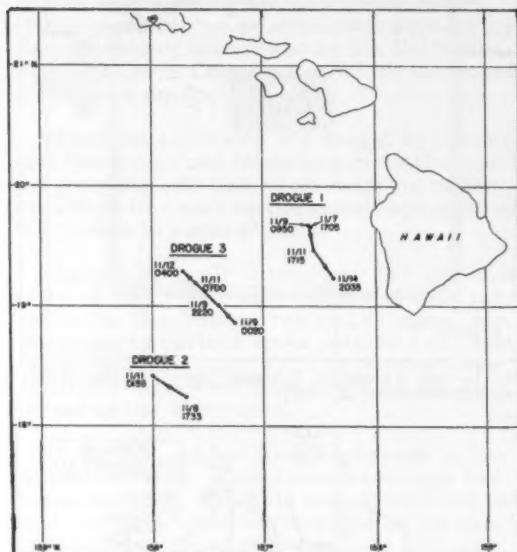


Fig. 3 - Drift of parachute drogues.

A watch for bird flocks and fish schools was kept throughout the cruise. A large number of birds and fish schools was seen. There seemed to be no association between fish schools and bird flocks and the eddy system.

During the cruise 786 drift bottles and 1,220 drift cards were released. The thermograph and barograph were operated continuously.

Standard marine weather observations were transmitted four times daily, except from November 12, 1965, at noon when the Weather Bureau requested a special weather report every 2 hours. These reports were transmitted until the cruise terminated.

The pyranometer was operated during the daylight hours.

Net radiometer readings were also taken for the Trade Wind Zone Oceanography Program.

Bathythermograph data were coded and transmitted four times daily to Fleet Numerical Weather Facility, Monterey, Calif.

The first drogue was nearly stationary for 2 days then moved south approximately 5 nautical miles per day. The second and third drogues moved in a northwest direction 8 and 12 miles per day, respectively (fig.3).

The trough and domes in the thermocline topography, which were associated with the eddies, showed displacement similar to those of the drogues.

The radio buoys (manufactured by Aquadyne Corp.) were acquired in order to determine the effective operating range under local conditions of these low-cost, low-power units. The 4-watt units could be detected at distances up to 8 miles with the ship's receiver and 2.8 miles with the radio direction finder, under the best conditions. The 1-watt unit could be detected at distances of up to 2 miles with the receiver and 0.3 mile with the RDF.

TRADE WIND ZONE OCEANOGRAPHIC STUDIES CONTINUED:

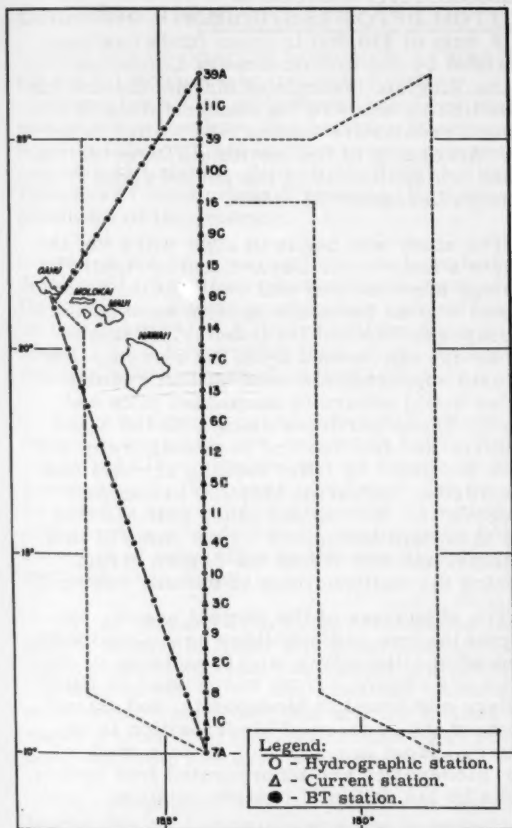
M/V "Townsend Cromwell" Cruise 21 (January 19-February 3, 1966): As part of the Trade Wind Zone Oceanography pilot study, the relationships between measured ocean currents and the distribution of properties are to be examined. To establish the necessary techniques and test the feasibility of such a study, this cruise of the Bureau's research vessel Townsend Cromwell was planned. The area of operations was in the Central North Pacific bounded by latitude 10° N. , 27° N. , and along longitude 154° W.

The primary purpose of the cruise--to develop techniques to measure ocean currents in the upper 500 m. from a moving ship--was accomplished. Field examination of data indicates that this method is feasible and applicable to the study of a variety of problems. There was also evidence that the major water masses in the upper 300 m. of the North Pacific Equatorial Current may flow at different speeds and/or direction. This was inferred from previous Trade Wind Zone Oceanography pilot study cruises, but was not measured directly.

At current station 6, southeast of Hawaii, the current changed from a westerly set at

50 m. to a northerly set at 150 m., and then to an easterly set at 250 m.

On each of 12 oceanographic stations spaced 90 miles apart along longitude 154° W., and between latitude 10° N. and 26.5° N., temperatures and salinity samples were collected at 20 levels to 1,500 m. Determinations for dissolved oxygen were made at each station and samples for PO₄-P analysis were collected and frozen.



Track chart of research vessel Townsend Cromwell, Cruise 21 (January 19-February 3, 1966).

Eleven current stations, located midway between oceanographic stations, were occupied for periods of 12 hours. Due to failure of other current meters on current stations 1 and 2, measurements at current stations 3 to 11 were made with an Ekman meter. On 26 current profiles from 10 m. to 1,000 m., 325 individual current measurements were made.

Bathythermograph casts were made to 270 m. at intervals of 3 hours on the way to station 7A, and between station 39A and Honolulu. Others were taken midway between and on oceanographic and current stations. Time-sequence bathythermograph casts were made on each current station at generally hourly intervals.

Bathythermograph data were transmitted each day to Fleet Numerical Weather Facility, Monterey, Calif.

Standard marine weather observations were made and transmitted.

Radiation from sun and sky was recorded daily and long-wave radiation measurements were made each night while on oceanographic stations.

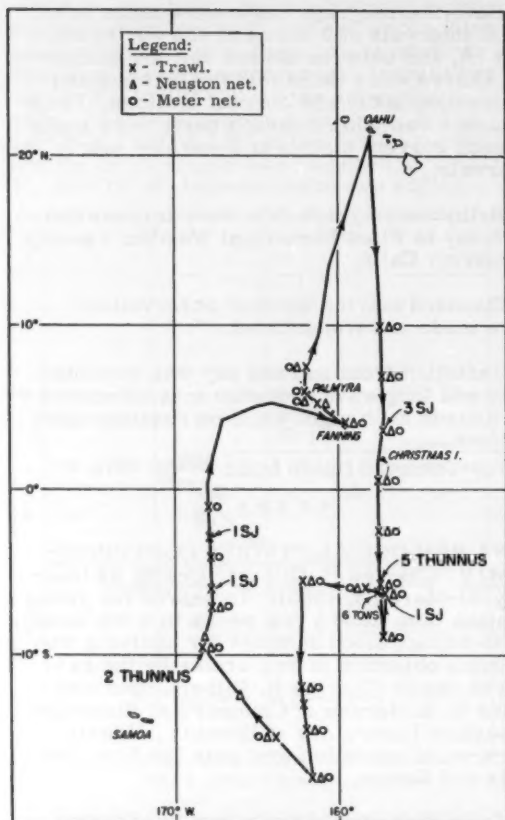
Note: See Commercial Fisheries Review, October 1965 p. 29.

TUNA BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 89 (January 20-March 3, 1966): To search for young skipjack tuna (aku) a few weeks to a few months old to collect blood samples for analysis was the main objective of this cruise by the research vessel Charles H. Gilbert, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, Hawaii. The area of operation was near the Line Islands and Samoa.

Young tuna of this age group, measuring from 1½ to 4 inches, are hard to catch and their elusiveness was apparent on this cruise. Of the 32 stations fished with a large midwater trawl net 25 feet in diameter, only 6 yielded young tuna (6 skipjack and 7 other tuna species). Neither of the other 2 nets used (one an unconventional net which skims the top 6 inches of water where young fish are often found, and the other, a net 6-feet square at the mouth, which was designed at the Bureau's Biological Laboratory, Honolulu, to fish at all depths) were successful in catching these young tunas in large numbers. The latter net, however, caught many larval tuna from ¼- to ½-inch in length. Unfortunately larvae this small does not provide blood in sufficient quantities for analysis.

Blood samples were obtained from 4 of the young skipjack. Although this is far from the hundreds of blood samples required to determine whether the fish came from a single group



Shows areas of operation during M/V Charles H. Gilbert Cruise 89 (January 20-March 3, 1966).

or whether they could be separated into several genetically different groups or subpopulations, it showed that it was indeed possible to draw blood samples from these tiny fish and the ultimate feasibility of this approach.

A large number of deep-sea fish and shrimp were also taken in the midwater trawl. Many of these fish represented rare groups. These fish and shrimp were quick frozen for subsequent study of deep water parasites by the University of California, Santa Barbara, Calif.

The Gilbert made a stop at Palmyra Island, where about 900 pounds of groupers and snappers were collected. These fish will be examined by the University of Hawaii scientists.

The vessel also brought back 140 live fish, mostly large mullets from Palmyra Island, which are to be used for experiments at the Oceanic Institute.

Note: See Commercial Fisheries Review, May 1966 p. 19.



Chesapeake Bay

RADIOACTIVE WASTES IN BOTTOM DEPOSITS STUDIED:

A sum of \$20,000 in grant funds has been awarded by the Atomic Energy Commission to the Virginia Institute of Marine Science for a continuing study of the concentration of suspended radioactive wastes into bottom deposits. According to the Institute's Director, the funds are applicable to the period January 1 through December 31, 1966.

The study was begun in 1960 when the Institute's head of the Department of Applied Biology hypothesized that radionuclides released into an estuarine system such as the Chesapeake Bay and its tributaries, might not be quickly flushed from the system. Early tests supported his concept that radionuclides would adhere to suspended silts and clays. These particles along with the algae, bacteria, and detritus are constantly removed from the water by filter-feeding animals and deposited on estuarine bottoms in compact biodeposits. Worms and other animals that live in bottom sediments ingest some of this material and mix it into the bottom strata, causing the radionuclides to become residual.

The objectives of the project are to: (1) Determine how radionuclides associated with suspended silts, clays, algae, bacteria, or detritus are removed from suspension by filter feeders and bound in biodeposits; and (2) understand the process of biodeposition in an estuary. Most important of all is a study of how biodeposits are incorporated into sediments by the action of benthic animals.

Experiments call for oysters and other test animals to be held in troughs where they will continually receive filtered water containing particles of known size. Sizes and numbers of particles entering each trough will be measured by a Coulter Counter. Particle removal by the test animals may then be determined.

The Institute's Director said, "We live in an age in which it becomes imperative to un-

derstand the final disposition of these sometimes dangerous by-products of man's inventiveness. There is no way of knowing when or where radioactive substances may be released upon society, and we must have knowledge of the possible effects and how to combat them." (Virginia Institute of Marine Science, April 14, 1966.)



Columbia River

"OPERATION COHO" LAUNCHED AS PART OF HATCHERY EVALUATION STUDY:

Plans for a Columbia River hatchery evaluation study involving the marking of about 6 million coho (silver) salmon over a two-year period was announced April 27, 1966, by the Bureau of Commercial Fisheries, U. S. Department of the Interior.

Under the program, which was launched in June, some 3 million young coho salmon of the 1965 brood year produced in hatcheries on the Columbia and its tributaries were to be marked by clipping their fins. An equal number will be marked during 1967.

Some of those marked cohos will return from the ocean as jack salmon in 1967. Starting in 1968, the remainder will return as full grown adults. Numbers of marked fish recovered in sport and commercial fisheries will provide a basis for determining the contribution of hatcheries to the overall fishery of the Pacific Coast.

Dr. L. Edward Perry, Director of the Bureau's Columbia River Program Office, said "Operation Coho" is a companion project to "Operation Fin Clip," the giant fall chinook salmon marking effort that started in 1962 in which a total of 32 million of that species have been marked over a 4-year period.

The purpose of both projects is to evaluate hatcheries as fish producers and to help decide whether expenditure of further funds to keep them operating is economically sound.

"Operation Coho" will involve 20 hatcheries. Of those, 5 are National Fish Hatcheries operated by the Bureau of Sport Fisheries and Wildlife, and Wildlife Service, U. S. Department of the Interior; 9 operated by the Washington Department of Fisheries; and 6 by the Fish Commission of Oregon.

About 10 percent of the coho salmon produced in each hatchery will be marked, except at Eagle Creek National Fish Hatchery, where 20 percent are to be clipped.

Cooperating with the Fish and Wildlife Service in "Operation Coho" are Fish Commission of Oregon, Oregon Game Commission, Washington Department of Fisheries, California Fish and Game Department, and fishery agencies of British Columbia.

Note: See Commercial Fisheries Review, May 1966 p. 21; Sept. 1963 p. 45; Oct. 1963 p. 31.

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CLARIFICATION SOUGHT ON INDIAN COMMERCIAL FISHERY:

The proposed start of commercial fishing by Yakima Indians on the Columbia River above Bonneville Dam on April 18, 1966, caused the Oregon Fish Commission to be very much concerned, according to the State Fisheries Director. The Indians would be fishing within the framework of an ordinance passed by the Tribal Council on March 23 but in violation of State law. The Fisheries Director pointed out that the Washington Department of Fisheries and the Oregon Fish Commission, the agencies responsible by statute for managing the commercial fisheries on the Columbia River, are still collecting vitally needed biological data before making any decision on a possible season for the non-Indian commercial fishery. A public hearing was scheduled on April 26 in Portland to consider the matter.

Important information was being collected from the test fishing program conducted by the two departments from March 15 through the end of April. In addition, dam counts were being studied carefully and other pertinent information collected as a basis for predicting the size of the spring run which in turn will govern thinking on proposed fishing regulations.

Because the run was expected to be somewhat smaller than in 1965, and in view of anticipated upriver passage problems, the two departments were very apprehensive about extensive fishing on that run. Apparently the very vital biological data which are still being collected were not considered by the Tribal Council in establishing their regulations which were set in March. As a result, the action by the Yakima Tribal Council (ostensibly to permit fishing to begin 9 days in advance of the regulation meeting by the State

agencies) was particularly disappointing. The Oregon Fish Commission believes that the needs of the resource are not being given the consideration they deserve by the Indian body.

The Yakimas who fish commercially with gill nets in the Bonneville pool area and on upstream contend they are within their rights granted by the treaty of June 9, 1855. During a press conference on Indian fishing problems in Portland on March 4, 1966, it was announced that the State planned to take action against Indians fishing above Bonneville Dam in violation of State laws. Some progress has been made in resolving the Indian fishing problem in recent years but the gains were rather insignificant in the face of the growing problem, Oregon's fisheries director said.

When the Dalles Dam flooded out Celilo Falls, the Indians were paid \$27 million to compensate for loss of their dip-net fishery there. Following loss of the Celilo site, the Indian commercial fishery in the Columbia declined temporarily. However, from a low catch of 39,000 pounds of salmon and steelhead in 1959, the Indian commercial fishery has increased steadily each season until 1965 when an estimated 1 million pounds were taken by the tribesmen. The Commission believes that the sharp increase in the Indian fishery will threaten the future of the Columbia River resource (particularly certain runs) and jeopardize the existing salmon management program.

The Fisheries Director said law enforcement officers of Washington and Oregon had mutually drawn up plans to enforce commercial fishing regulations. In Oregon, both the Governor and Attorney General support the stand that the State has exclusive authority to manage the fishery resources of Oregon and that present State conservation laws and regulations apply equally to all citizens, Indian as well as non-Indian. Consequently, enforcement of State laws will be undertaken irrespective of any Indian tribal ordinance.

Early in March wholesale fish dealers were notified of the intention of the fisheries agencies to step up enforcement activities. In a letter widely distributed to buyers and others it was stated that any fish dealer purchasing fish taken from closed waters will be subject to prosecution.

Because any commercial fishing by the Yakima Indians above Bonneville will be in

violation of State law, citations will be issued to fishermen or dealers involved in taking or handling fish from the closed area.

Enforcement activities are to be closely coordinated by the Oregon State Police and Washington fish and game law enforcement office. An all-out effort is planned to uphold the State laws in both states to assure protection of the very vital spring chinook stocks. This planned action received support when the Federal District Court refused to issue an injunction requested by the Yakima Tribal Council to prohibit State agencies from arresting Yakima Indians fishing under the provisions of the tribal ordinance. The Court's decision indicated the Indians will have to take their chances in court if they choose to ignore State conservation regulations.

The Fisheries Director said, "It is not our intention to deprive the Indians of any treaty right by this action. We are in need of further meaningful clarification of treaty rights and State authority over Indian fishing activities. In the absence of this, but with our present statutory authority we are taking this action to insure having runs of fish to work with when the determination is made. The resource needs the protection of a meaningful management program." (Oregon Fish Commission, April 15, 1966.)



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, FEBRUARY 1966:

Fresh and Frozen: The Armed Forces are a major buyer of fresh and frozen fishery products. Purchases of fresh and frozen fishery products for the Armed Forces in February 1966 totaled about 2.5 million pounds with a value of about \$1.6 million. This represents an important market for the U. S. fishing industry.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Personnel Support Center, February 1966 with Comparisons

QUANTITY				VALUE			
February	Jan. -Feb.	February	Jan. -Feb.	February	Jan. -Feb.	February	Jan. -Feb.
1966	1965	1966	1965	1966	1965	1966	1965
(1,000 Lbs.)				(\$1,000)			
2,531	2,036	4,754	4,406	1,642	1,311	2,907	2,776

In February 1966 purchases of fresh and frozen fishery products for the Armed

Forces were up 13.9 percent in quantity and 29.8 percent in value from the previous month. The increase was due mainly to larger purchases of shrimp, scallops, salmon steaks, ocean perch fillets, and haddock fillets and portions.

Table 2 - Principal Fresh and Frozen Fishery Products Purchased by Defense Personnel Support Center, February 1966 with Comparisons

Product	February				Jan.-Feb.			
	1966		1965		1966		1965	
	Qty.	Avg. Cost	Qty.	Avg. Cost	Qty.	Avg. Cost	Qty.	Avg. Cost
	Lbs.	C/Lb.	Lbs.	C/Lb.	Lbs.	C/Lb.	Lbs.	C/Lb.
Shrimp:								
raw headless . . .	92,230	112	94,700	97	144,230	184,400		
peeled and deveined	93,100	146	31,080	135	127,100	154,160		
breaded	337,917	98	242,020	89	515,867	603,420		
molded and breaded	21,900	68	19,150	72	28,900	95,250		
Total shrimp . .	545,147	108	406,950	96	816,097	1,037,230		
Scallops	273,750	56	156,180	84	526,500	321,580		
Oysters:								
Eastern	46,848	123	90,296	100	95,904	138,772		
Pacific	13,000	91	23,982	80	38,550	62,226		
Total oysters . .	59,848	116	123,278	96	134,454	200,998		
Fillets:								
Cod	33,300	43	82,850	36	54,300	114,750		
Flounder	270,700	47	236,000	37	627,200	624,450		
Ocean perch . . .	583,600	41	325,500	36	987,500	694,790		
Haddock	164,000	39	145,900	38	384,500	272,000		
Haddock portions .	230,138	52	101,050	48	467,388	309,550		
Steaks:								
Halibut	107,500	50	105,750	49	197,100	208,650		
Salmon	20,577	71	9,490	65	31,937	14,490		
Swordfish	-	-	320	61	500	860		

Compared with the same month in the previous year, purchases in February 1966, were up 24.3 percent in quantity and 25.2 percent in value. Average prices were generally higher in February 1966 as compared with the same month in 1965.

Canned: Salmon and sardines were the main canned fish items purchased for the Armed Forces in January-February 1966.

Table 3 - Canned Fishery Products Purchased by Defense Personnel Support Center, February 1966 with Comparisons

Product	QUANTITY				VALUE			
	February		Jan.-Feb.		February		Jan.-Feb.	
	1966	1965	1966	1965	1966	1965	1966	1965
	... (1,000 Lbs.) (\$1,000) ...			
Tuna . .	1/	-	821	641	2/	-	466	291
Salmon .	11	5	2,061	6	7	4	1,377	5
Sardines .	179	80	211	111	102	49	118	69

1/ Less than 500 pounds.
2/ Less than \$500.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than shown because data on local purchases are not obtainable.

(2) See *Commercial Fisheries Review*, May 1966 p. 22. Source: U. S. Department of Defense, Defense Personnel Support Center, Philadelphia, Pa.

VETERANS ADMINISTRATION REQUIREMENTS FOR 1966:

Following are the estimated requirements of the Veterans Administration for fishery products to be procured in 1966:

Item	Case	Quantity
	Size	Case
Canned:		
Clams, chopped, in nat. juice	No. 3 Cyl.	2,000
Salmon:		
coho, dietetic	No. 1/2	2,100
medium red or coho with skin and backbone	No. 1	2,400
red or sockeye	No. 1	3,100
Sardines, veg. oil, Fancy Grade	15-oz.	1,000
Shrimp pieces, freeze-dried (peeled, headless, precooked) . .	No. 10	200
Tuna:		
lt. meat, solid pack, lge. pieces, dietetic	No. 1/2	2,300
lt. meat, chunk style, packed in veg. oil	64-oz.	6,300
Frozen:	Size	Pounds
Cod portions	4-oz.	43,000
Flounder portions	4-oz.	33,000
Haddock portions	4-oz.	74,000
Halibut steaks	4-oz.	27,000
Salmon steaks	4-5 oz.	6,200
Ocean perch fillets	8-12 per lb.	115,000
Sea scallops	med.	37,000

Note: Requests for bids will be announced as they are issued. For additional information, contact the Marketing Division for Subsistence, Veterans Administration Supply Depot, P. O. Box 27, Hines, Ill. 60141.



Fish Farming

POND-REARED CATFISH HAS GOOD MARKET POTENTIAL:

Probably more catfish are now raised annually in the United States than any other fresh-water fish--about 35 million pounds. Fish farmers are devoting more than 20,000 acres to raising catfish; about one-third of the acreage is in the South-Central States. Arkansas leads, followed by Texas, Louisiana, Mississippi, Missouri, Oklahoma, and some states outside this area. In addition to those acres where catfish are raised intensively, there are thousands more where raising catfish is part of a system of crop rotation--catfish one year, rice the next. After one year's growth, catfish (in the round or whole) sells for about 50 cents a pound at the fish farms or, after dressing and packaging, at 90 cents a pound at the retail level.

Catfish is also known by other names. It is often called Rocky Mountain dressed catfish, Mississippi River channel catfish, and farm-raised catfish. Occasionally, it is called barbed trout. The catfish has been tradi-

tionally accepted in the South-Central States, and the channel catfish is the most popular member of the family.

Economists of the Department of the Interior's Bureau of Commercial Fisheries say the commercial production of catfish in the United States can reach 60 million pounds a year.

Fish ponds in which to raise catfish range in size from less than 1 acre to 4 or 5 acres. To build a pond, the farmer builds a levee. A rectangular pond with a smooth bottom is favored because it permits the easiest use of a net to collect the fish. To get every last one of them, the pond is drained. Later, it may be planted with crops. It costs \$200-\$300 an acre to build a pond. The standard rental is \$50 an acre, with ponds and water supply provided. Water is obtained from wells 75-175 feet deep. In the Mississippi Delta, the supply of groundwater is unlimited because it is fed by the river and its tributaries.



Channel catfish

The most important fish raised in these ponds is the channel catfish, but farmers also produce bait minnows--fathead, golden shiners, goldfish--and buffalofish, crappies, bass, and frogs.

Nearly all farmers feed their pond-raised fish with pellets prepared to meet the nutritional requirements of the fingerlings. About 1.8 pounds of feed produce about one pound of weight gain in one year. The fish then weigh from $1\frac{1}{4}$ to $1\frac{1}{2}$ pounds and, after they are cleaned to be sold as food, weigh a pound or less. The farmers also fertilize the water to grow plants for the fish to eat. Production per acre per year is 750 to 1,000 pounds.

There are several alternatives for marketing catfish. Some farmers provide spawning facilities and raise the fish to fingerlings, which they can sell to other farmers at 5 cents apiece--or continue to raise the fingerlings to market size. Grownfish can be sold to stock ponds for fee fishing--or to restaurants or retailers as whole or dressed fish.

Nearly all sales of catfish as food products are made within 300 to 500 miles of the fish farms.

The main problem for the fish farmer to overcome is the expense of processing. It costs him 25 cents a pound to raise a fish and 10 cents to process it, during which 45 percent of the weight is lost. The farmer invests 52-53 cents a pound before he can sell the dressed fish for 90 cents. That's why most fish producers prefer to sell their fish live for about 50 cents a pound. Of necessity, fish farmers are trying to merchandise the catfish on its own identity, i.e., it is not a catfish caught just anywhere but one raised under ideal conditions in a farm pond.

Raising catfish has a good potential for the fish farmer. The possibility of expanding the industry is very good because production per acre is high and water supply is more than adequate. The Bureau is developing and demonstrating the use of gear best suited to the industry and gathering information on market conditions. However, Bureau economists warn that if production is greatly expanded, the market potential will change considerably. A significant increase in production could saturate existing markets and other less profitable outlets would have to be sought.



Fish Protein Concentrate

LEGISLATIVE AUTHORITY TO BUILD LARGE-SCALE PLANT RECOMMENDED BY INTERIOR DEPARTMENT:

Legislation which would authorize the U.S. Department of the Interior to develop practicable and economic means for the commercial fishing industry to produce a purified protein product known as fish protein concentrate (FPC) has the Department's support, it announced April 29, 1966. A bill now in Congress (S. 2720) would increase the present research and experimentation program and finance plants to produce FPC.

The Interior Department said there is a present need for one new plant and that it would cost no more than \$1 million. It would be based on research findings from the existing model-scale unit at Beltsville, Md., which is operated by Interior's Bureau of Commercial Fisheries. Scientists using a solvent extraction process developed a tasteless and

odorless fish protein concentrate from whole red hake, which has been termed "highly nutritious, inexpensive, and entirely fit for human consumption" by the National Academy of Sciences.

The next necessary step is to determine if an equally satisfactory product can be produced on a semi-commercial scale, Interior said. It added that it is also necessary to create more concentrate for testing purposes so it can be determined where and how much of it can be used as a supplement to other foodstuffs.

Building one plant at this time would provide guidance for future construction of solvent-extraction plants if and when they became necessary, the Interior Department said, explaining that research under way continues to seek whether fish other than hake can be used as successfully. Also, two other basic processes for producing the concentrate are being studied. It may be that development of either or both these processes would produce a better product and make the solvent-extraction process relatively uneconomical or even obsolete, Interior said.

It has been noted by Interior that several major United States food manufacturers are interested in testing the feasibility of incorporating FPC into one or more of their products.

Organizations such as the Agency for International Development, the United Nations Children's Fund, World Health Organization, and the Food and Agriculture Organization of the United Nations also are interested in supplementing the diets of millions of protein-starved people in developing nations by using the protein concentrate, the Interior Department said.



Fur Seals

PRICES FOR ALASKA SKINS AT SPRING 1966 AUCTION:

The semiannual auction of United States Government-owned sealskins was held April 21-22, 1966, in Greenville, S.C. Approximately 21,000 Alaska sealskins were offered for sale for the account of the United States Government, together with 4,700 Alaska sealskins for the Government of Japan, 23,000

South African sealskins, and 2,800 Uruguayan sealskins. Prices in general were up about 25 percent over the October 1965 sale. Average prices per skin for the U.S. skins were (changes from October 1965 sale shown in parentheses): Matara \$120.51 (up 21.2 percent); Black \$138.61 (up 27.1 percent); Kitovi \$118.46 (up 22.9 percent); Natural Lakoda \$102.10 (up 26.3 percent); Brown Lakoda \$56.69 (up 46.8 percent); Black Lakoda \$64.79 (up 4.0 percent).

At the spring 1966 auction, male and female skins were sold in mixed lots the same as in the fall 1965 auction. A total of 16,283 fur sealskins were offered for sale by the U.S. Government at the previous auction held in October 1965 (11,760 dressed, dyed, machined, and finished skins, 3,148 Lakoda skins, and 1,375 sheared skins).

Note: See *Commercial Fisheries Review*, January 1966 p. 30, and June 1965 p. 21.



Great Lakes

MICHIGAN'S FIRST PLANTINGS OF SILVER SALMON:

The State of Michigan's introductory plantings of silver or coho salmon were made this past March by the Conservation Department of that State in the Platte River, Benzie County, and Bear Creek, Manistee County. The first release was made on March 22 when 50,000 silver salmon smolts were stocked in the Platte River at the bridge on Maple City Road. On the following day, another 200,000 fish were liberated into the same stream directly from the Department's Platte River Trout Rearing Station.

Plantings also got under way March 23 in Bear Creek where about 350,000 of the salmon were to be released the following week. The releases were earlier than expected due to an unexpected spring break-up. As soon as stream conditions permitted in the Upper Peninsula, 225,000 young silver salmon were to be stocked in Baraga County's Big Huron River. This would complete the State's first-year program of introducing these fish in Michigan's Great Lakes waters. If all goes well, the 5-6 inch fish planted this past spring will quickly migrate downstream into Lakes Michigan and Superior. They will grow for about two years in those big waters, then re-

turn to the rivers to spawn in the fall of 1967.

As part of the State of Michigan Conservation Department's overall program to revitalize fishing in the Great Lakes, the Platte River and Bear Creek each received 50,000 yearling rainbow trout during March when the salmon releases were made. Another 50,000 rainbows were to go into the Big Huron River at the same time the salmon were planted. It was hoped the additional plantings will help step up runs of steelheads (migratory rainbows) in Great Lakes streams.

Michigan's full-scale releases of silver salmon will put Michigan sportsmen strictly on their honor since those fish are not protected by law. Anglers catching silver salmon on this past spring were urged to return them to the planted waters. Actually, fishermen may have a hard time telling the difference between silver salmon and rainbow trout because the two species as yearlings bear a striking resemblance to each other. However, one clue in distinguishing them is that the salmon has spots only on the top half of its tail while the rainbow's entire tail is spotted. Also, the anal fin of the salmon and trout differ. In the salmon, this fin is greater in length than it is in height. The opposite is true of trout, including the steelhead.

Since silver salmon are new in Michigan and not covered by regulations, there is yet no size limit for them. However, anglers can help future fishing for silver salmon by not creeling any fish under the seven-inch limit which covers rainbow trout. In most cases, this will automatically rule out keeping silvers because the big majority of salmon smolts planted this past spring are below that size. (*News Bulletin*, Michigan Department of Conservation, Lansing, March 24, 1966.)

Note: See *Commercial Fisheries Review*, February 1966 p. 18.



Great Lakes Fisheries Explorations and Gear Development

ALEWIFE SPAWNING MIGRATIONS STUDIED:

M/V "Kaho" Cruise 31 (March 29-April 28, 1966): To delimit alewife concentrations and to follow their spring spawning migra-

tions shoreward was the objective of two 10-day surveys in southern Lake Michigan by the exploratory fishing vessel *Kaho*, operated by the Bureau of Commercial Fisheries, U. S. Department of the Interior. The surveys were scheduled to cover the portion of Lake Michigan in waters from off Ludington, Mich., and Two Rivers, Wis., southward.



U. S. Bureau of Commercial Fisheries exploratory fishing vessel *Kaho*.

The characteristics and timing of the alewife runs are of extreme importance to the newly developing Lake Michigan industrial fish fisheries which now supply both pet-food manufacturers and fish-meal reduction plants. The information will also help lakeside municipal and industrial water users to cope with alewife spawning migrations which create problems at some Lake Michigan water intakes.

A high-resolution, fish-detecting white-line, echo-sounder was the primary assessment tool to be used. Sounding runs were to be made at and between previously established fishing stations around the perimeter of the Lake. A standard 50-foot (headrope) bottom trawl was to be used to verify the composition and density of fish concentrations revealed by the echo-sounding runs.



Gulf Fishery Investigations

Some of the highlights of studies conducted by the U. S. Department of the Interior's Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex., during January-March 1966:

SHRIMP BIOLOGY PROGRAM: Shrimp Larvae Studies: During the quarter, examination of plankton samples collected in July and August 1964 indicated that planktonic stages of *Penaeus* sp. shrimp were six times more abundant in waters between Galveston and Port Mansfield than between Galveston and the Mississippi River. Greatest numbers were in samples from the 15- to 25-fathom depth zone. Of the total catch of *Penaeus* sp. 11 percent were nauplii, 76 percent protozoae, 5 percent mysids, and 3 percent postlarvae. The abundance of indicators of recent spawning (nauplii and protozoae) suggests that more spawning occurred during July and August than in May and June.

Four cruises were made in waters off Galveston to locate bottom concentrations of *Penaeus* sp. postlarvae during the period December 1965-February 1966. Samples were collected from the water column as well as from the substrate at station depths of 3 to 20 fathoms. Results showed that *Penaeus* sp. postlarvae were more abundant both on bottom and in the water column inshore at 3-fathom stations. A major objective of this study was to determine whether postlarvae had left the water column and burrowed into the substrate when water temperatures fell below 16° C. (60.8° F.) Relatively cold water temperatures (mean 13.4° C. or 56.2° F.) prevailed during that study period. Although few postlarvae were taken in the initial cruises, it appeared that they were more readily available on bottom than in the water column. This was most evident at depths greater than 6 fathoms. In the later cruises, particularly at 3-fathom stations, large numbers of postlarvae occurred both in the water column and on the bottom.

It is planned to resume this study next fall and winter. With improved gear and better knowledge of where these postlarvae are, it is hoped to gain a better understanding of the habits of *Penaeus* sp. postlarvae before their spring movement into the nursery area.

A morphological study comparing measurements of most of the body parts of pink and brown shrimp larvae was near completion during the quarter. Preliminary examination of the data indicates that naupliar substages exhibit no significant differences between species. In the protozoal and mysis stages, however, there are slight differences, which we hope will be sufficient to differentiate the species.

Cultivation of Shrimp in Artificial Ponds: Preparation of ponds and equipment for the next rearing season were made. The ponds were drained and all potential shrimp predators were removed. The filter boxes, through which inflowing water passes, were cleaned and refilled with crushed shell. A scanning tele-thermometer with a continuous recorder was tested, adjusted, and installed. Its thermal probes were placed at critical positions in the ponds. Screens for sorting postlarval shrimp were made and the collecting and sampling nets used the previous season were repaired.

Algal cells, occurring in the waters of the shrimp culture ponds, were being cultured in several concentrations of inorganic and organic fertilizers. This information will be an aid in establishing guidelines for fertilizer applications to the rearing ponds.

Surveys of Postlarval Abundance and Fisheries for Bait (Juvenile) Shrimp: Semiweekly sampling for postlarval shrimp at Galveston Entrance, and weekly sampling at Aransas Pass, Rollover Pass, and Sabine Pass continued during the quarter. Relatively mild weather prevailed during the early part of the winter and a few postlarvae came into the bays until mid-January. At that time, cold weather apparently curtailed immigration. Catches of postlarval brown shrimp increased during late February and March, but it was too early to tell whether the peak migration for the year had been reached.

Statistical coverage of the bait-shrimp fishery in Galveston Bay was continued on a weekly schedule. As is characteristic of the season, few juvenile shrimp were taken by the Galveston Bay bait shrimp fishery. Most of the shrimp sold as bait were white shrimp from the Freeport area.

Drift bottles and seabed drifters were released in mid-February in near-shore depths (3 to 7 fathoms) between Galveston and Freeport. The aim of this study is to define inshore currents and to determine their possible role in the transport of postlarval shrimp to the passes. Through March, 27 percent of the seabed drifters and 47 percent of the drift bottles had been recovered. Water movement, according to recoveries, has been from east to west. Almost half of the bottles recovered were found on south Padre Island.

Migrations, Growth, and Mortality of Commercial Shrimp: Work during the quarter was devoted to analyzing data from past mark-recapture studies. Examination of the growth information collected from the experiments conducted on pink shrimp in Florida during January and October of 1965, reveals that the estimates from those two studies are similar. Investigation of white shrimp growth in Galveston Bay during 1965 produced rates that are comparable to those gathered in 1963. Analysis of brown shrimp data collected from Mississippi during 1963 has yielded good estimates of the growth parameters for this species.

Efforts are under way to increase the efficiency and mobility of field staining operations. Toward that end, fiberglass tanks have been constructed to replace heavy wooden ones formerly used for holding shrimp; a light weight, disposable container for releasing shrimp was being tested; and a rapid means for staining shrimp has been devised.

ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries: The previous year's biological sampling pattern was evaluated and modified during this quarter. Sampling stations were maintained in each subbay area of the Galveston estuarine system on the basis of major estuarine nursery units. These nursery units are Dickinson Bayou (lower Galveston Bay), Clear Lake (upper Galveston Bay), Cedar Bayou (mouth of San Jacinto River), Cross Bayou and Double Bayou (Trinity Bay), and Marsh Point (East Bay). One station was maintained in the Bolivar Roads Tidal Pass to monitor the movement of animals through that area.

The croaker was the most numerous major species caught in trawls during the quarter, followed in de-

scending order of abundance by the bay anchovy, spot, large-scale menhaden, blue crab, white shrimp, and sea trout, whiting, brown shrimp, hardhead catfish, and gafftopsail catfish. The croaker and bay anchovy accounted for over 85 percent on the trawl catch. Croakers and spot (0 year class) increased in abundance during the quarter. A few juvenile white and brown shrimp evidently remained in the estuary all winter.

Postlarval brown shrimp were not caught in the estuary during early winter as they were in 1965. They were first caught (average 2 per 5-minute tow) in Bolivar Roads Tidal Pass, lower Galveston Bay (except in the peripheral areas), and in East Bay during late February. By early March, postlarvae were collected everywhere in the estuary except Trinity Bay. Cool water temperature in combination with low salinities probably excluded postlarvae from those waters.

EXPERIMENTAL BIOLOGY PROGRAM: Behavior and Ecological Parasitology: The potential ecological significance of burrowing as a low temperature response of postlarval brown shrimp was examined further during the quarter. Analysis of the laboratory's field results reveals a marked non-random distribution of brown shrimp postlarvae in regard to water temperatures. Most of those shrimp were taken at temperatures of 19° - 22° C. (66.2° - 71.6° F.), a range similar to that which caused emergence of burrowed postlarvae in the laboratory. Those and other field results have been incorporated into a manuscript titled, "A Behavioral Comparison of Postlarval *Penaeus aztecus* and *P. setiferus*. With Special Reference to Burrowing as a Response to Reduced Temperature." The included field and laboratory data support the conclusion that burrowing may have survival significance to brown shrimp postlarvae before and after their arrival at bays in early spring.

Experiments designed to provide estimates of postlarval swimming stamina are in progress, representing one phase of a continuing study on the nature of postlarval movements.

Continuous measurement of field temperatures is nearing completion at the Bureau's East Lagoon Laboratory. Measurements made in 1965 showed a shallow peripheral zone to be consistently warmer than nearby deeper water during the spring period when brown shrimp postlarvae move into the estuarine environment. One annual cycle has been recorded and data being taken will be used for comparison with spring temperature patterns in 1965.

Growth and Survival Studies: A study was conducted with postlarval brown shrimp to observe growth at various population densities. In past growth experiments there has been a wide final size range of animals in a given aquarium. The current test was made to determine if size variation could be attributed to crowding or container size. Test containers were different size beakers--1-, 2-, and 4-liter capacity. Four densities of animals were tested at each capacity--1, 5, 10, and 20 shrimp. These were maintained for 28 days at approximately 26° C. (78.8° F.) 23‰ salinity. Water was changed in all containers at about 5-day intervals. At the end of the test period, all animals were weighed and measured.

At densities of 1, 10, and 20 shrimp the difference in growth between containers was slight. With the ex-

ception of beakers containing one animal, there was an increase in growth with increase in beaker size. The difference in size was most pronounced with 5 animals in the beakers. Best growth was in the group of 5 animals in a 4-liter beaker. Those shrimp exhibited an average growth rate of 1.11 millimeters per day during the 28-day test period.

Two studies are being conducted at the request of the laboratory Shrimp Dynamics Program. The first study involved testing survival of postlarval brown shrimp exposed to low temperatures. Such information is needed as a guide in field sampling for abundance of postlarvae arriving in nursery areas after winter's last lethal low temperatures. Shrimp were exposed to low temperature for 24, 48, and 72 hours. Three temperatures were used-- 2° , 5° , and 8° C.--with a control group held at 17° C. (62.6° F.). No animals survived exposure to 2° for 24 hours. After 48 hours, survival at 5° decreased to 55 percent. Survival at that temperature decreased to 14 percent after 72 hours with other temperatures (8° and 17° C.) maintaining near 100 percent survival. The second study, which involves testing the effect of crowding on survival of juvenile and sub-adult white shrimp has been in progress.

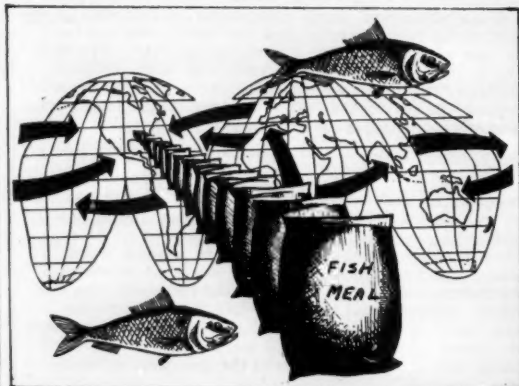
Note: See *Commercial Fisheries Review*, March 1966 p. 24.



Industrial Fishery Products

U. S. FISH MEAL SUPPLIES IN 1965 AND EARLY 1966:

World fish meal production in 1965 dropped for the first time since Peru became the major producer-exporter of this protein-rich poultry and animal feed ingredient. The decline in world production was the result of a large decrease in Peruvian output which more than offsets production increases in the United States, Iceland, and Norway. As world demand for fish meal continued to increase, the lower production forced prices up to record levels.



U. S. supplies of fish meal in 1965 totaled 524,000 tons--down 22 percent from 1964. U. S. production of 253,000 tons increased 6 percent over the previous year, but imports--largely from Peru--amounted to only 271,000 tons, or down 38 percent.

With a strong domestic demand and small supplies available, prices of both domestic and imported fish meal in New York City advanced from near \$140 a ton in January 1965 to \$186 in December and averaged \$165 for the year. This was \$33 a ton above the 1964 average price, and the highest on record.

During January and February 1966, imports from Peru were 17 percent below a year earlier. United States demand for fish meal was strong along with continued expansion in the broiler industry, but considerable resistance has built up to the high price levels.

Peru normally accounts for about two-thirds of the fish meal production of the six major fish exporting countries and contributes about three-fourths of total U.S. imports. But there has been some concern among Peruvian biologists that Peru could not maintain her position as leading producer-exporter if the anchovy catch was continued at the level of the 1963/64 season. With this in mind, and after a decrease in output during the 1964/65 season, the Peruvian Government imposed a three-month closed season beginning June 1 with the 1966/67 season opening on September 1, 1966. Should fish meal production for the balance of the 1965/66 season be on a par with the previous season, production for the entire 1965/1966 season would not be materially different from the 1964/65 season. Peruvian marketing organizations and dealers expected world production would be near that of 1965 and attempted to maintain the high price level that existed in December 1965.

However, record anchovy landings in January and February 1966 caused stocks to accumulate rapidly, and by mid-March they had increased to nearly 50 percent above a year earlier. As Peruvian stocks began to build up, prices started to weaken.

About mid-April 1966, Peruvian fish meal prices (burlap bagged) f.o.b. East Coast and Gulf ports averaged \$152 a ton, compared with \$150 a ton at the same time a year earlier.

(U.S. Bureau of Commercial Fisheries, Branch of Current Economic Analysis, Industrial Fishery Products Section.)

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, March 1966: Preliminary data as collected by the Bureau of Commercial Fisheries, U. S. Department of the Interior:

U. S. Production ^{1/} of Fish Meal, Oil, and Solubles, March 1966 (Preliminary) with Comparisons			
Area	Meal	Oil	Solubles
	Short Tons	1,000 Pounds	Short Tons
March 1966:			
East & Gulf Coasts	1,216	258	1,682
West Coast ^{2/}	2,495	289	1,416
Total	3,711	547	3,098
Jan.-Mar. 1966 Total . . .	8,111	1,153	5,617
Jan.-Mar. 1965 Total . . .	8,181	1,709	2,667

^{1/}Does not include crab meal, shrimp meal, and liver oils.

^{2/}Includes American Samoa and Puerto Rico.

Production, February 1966: During February 1966, a total of 268,000 pounds of marine animal oils and 2,064 tons of fish meal were produced in the United States. Compared with February 1965 this was a decrease of 210,000 pounds of marine animal oils and 193 tons of fish meal and scrap. Fish solubles

U. S. Production of Fish Meal, Oil, and Solubles February 1966 ^{1/} with Comparisons				
Product	1/1966	Feb. 1965	Jan.-Feb. 1/1966	Total 1965
 (Short Tons).			
Fish Meal and Scrap:				
Herring	2/	298	2/	542
Menhaden 3/	-	-	2/	2/
Tuna and mackerel . .	1,360	1,635	2,958	3,549
Unclassified	704	324	1,442	936
Total 4/	2,064	2,257	4,400	5,027
Fish Solubles:				
Menhaden	2/	-	2/	-
Other	1,350	803	2,519	1,710
Total	1,350	803	2,519	1,710
 (1,000 Pounds)			
Oil, body:				
Herring	-	124	-	287
Menhaden 3/	-	-	2/	2/
Tuna and mackerel . .	183	254	370	490
Other (inc. whale) . .	85	100	236	274
Total oil	268	478	606	1,051

^{1/}Preliminary data.

^{2/}Included in "unclassified" or "other."

^{3/}Includes a small quantity of thread herring.

^{4/}Does not include a small quantity of shellfish and marine animal meal and scrap

because production data are not available monthly.

Source: U. S. Department of the Interior, Bureau of Commercial Fisheries.

production amounted to 1,350 tons--an increase of 547 tons as compared with February 1965.

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-February 1966: Based on domestic production and imports, the United States available supply of fish meal for the first 2 months in 1966 amounted to 44,961 short tons--1,579 tons (or 3.4 percent) less than during the same period in 1965. Domestic production was 627 tons (or 12.5 percent) lower and imports were 952 tons (or 2.3 percent) lower than in January-February 1965. Peru continued to lead other countries with shipments of 27,118 tons.

U. S. Supply of Fish Meal and Solubles, January-February 1966			
Item	Jan.-Feb.		Total 1965
	1966	1965	
. . . . (Short Tons). . . .			
Fish Meal and Scrap:			
Domestic production:			
Menhaden	-	1/	175,838
Tuna and mackerel	2,958	3,549	25,410
Herring	1/	542	12,859
Other	1,442	936	39,264
Total production	4,400	5,027	253,371
Imports:			
Canada	6,839	6,046	43,830
Peru	27,118	32,512	209,801
Chile	1,932	2,080	5,651
Norway	22	-	78
So. Africa Rep.	500	200	5,100
Other countries	4,150	675	6,206
Total imports	40,561	41,513	270,666
Available fish meal supply	44,961	46,540	524,037
Fish Solubles 2/:			
Domestic production	2,519	1,710	98,017
Imports:			
Canada	149	249	1,488
Iceland	33	-	-
Other countries	12	2,066	3,650
Total imports	194	2,315	5,138
Available fish solubles supply	2,713	4,025	103,155

1/Included with "other."
2/ Wet weight basis except for imports from South Africa Republic.
Source: U. S. Department of the Interior, Bureau of Commercial Fisheries, and U. S. Department of Commerce, Bureau of the Census.

1/Included with "other."

2/Wet weight basis except for imports from South Africa Republic.

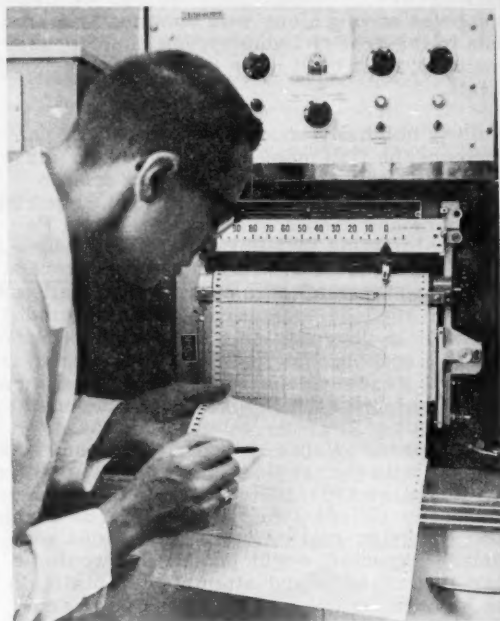
Source: U. S. Department of the Interior, Bureau of Commercial Fisheries, and U.S. Department of Commerce, Bureau of the Census.

The United States supply of fish solubles during January-February 1966 amounted to 2,713 tons--a decrease of 32.6 percent as compared with the same period in 1965. Domestic production of fish solubles increased 47.3 percent and imports of fish solubles decreased 91.6 percent.

SCIENTISTS STUDY WHY FISH OILS BECOME RANCID:

A new research unit of the Bureau of Commercial Fisheries, U. S. Department of the Interior, has begun studying the problems produced by the oxidation of fish oils. Oxidation is the combination of oxygen from the air or other source with these oils--producing new compounds and ultimately undesirable flavors or odors.

Scientists at the Bureau's Seattle, Wash., technological laboratory will study the oils while they are still in the fish, after they are extracted, and especially at very early stages of the normal storage period.



A chemist of the U. S. Bureau of Commercial Fisheries Technological Laboratory at Seattle, Wash., studies a fatty acid analysis of fish oil as the results evolve from an instrument called a gas chromatograph.

Fish oils are used today to make pharmaceuticals, plastics, and chemicals. A large market for fish oils exists in the European margarine industry.

In the past, research revealed much information about the changes fish undergo after extensive oxidation. But little was discovered

about the way oil from freshly-caught fish oxidizes, and how this can be controlled. Early changes have an important impact both on the quality of industrial oils and on the flavor and quality of fresh fish. These changes do not cause fresh fish to become inedible; however, they do lower quality by producing either a flat tasteless condition or a slightly unpleasant rancid flavor. Researchers hope that long-term findings of the new unit will establish the fundamental knowledge necessary to control such changes.

New research data may prove valuable in producing industrial oil of better quality. In time, research of the type conducted by the new unit may develop fish oils, prepared under food-plant conditions, that will be acceptable as human food in the United States. A significant potential use of fish oils was recently foreshadowed by a statement of the American Heart Association. The Association recommended greater use of polyunsaturated fats in the human diet to reduce blood serum cholesterol, which may reduce the incidence of the heart condition known as atherosclerosis. Fish oils have a high proportion of polyunsaturated fatty acids.

The new group, called the Food Science Pioneer Research Unit, occupies space in the new Bureau laboratory building on Montlake Boulevard East, in Seattle. It has seven full-time and four part-time employees. Some of its work will be done in cooperation with the University of California at the Davis and Berkeley campuses.

The unit is headed by Maurice E. Stansby, who has been Laboratory Director of the Bureau's Technological Laboratory in Seattle since 1942. He will continue to hold this post, too, until his successor is chosen.



Maine Sardines

PROGRESS IN LONG RANGE PREDICTIONS OF HERRING SUPPLY:

Progress on a method for predicting the quantities of herring that might be available off the Maine coast from several months to a year in advance was reported by scientists of the U. S. Bureau of Commercial Fisheries at an industry-government meeting, held in Augusta, Me., this past April.

This and other developments were presented to 40 Maine sardine canners and their representatives during a briefing on a major long-term Gulf of Maine herring research program being conducted by the Bureau's biological laboratory at Boothbay Harbor. At the meeting, the difficult matter of making accurate predictions was pointed out and that several promising breakthroughs were being further evaluated. The industry looks upon such predictions as being of incalculable importance in the successful operation of sardine canneries in Maine.

Activities of a large Soviet fishing fleet in the Gulf of Maine was another principal topic of the meeting. The Bureau's project director said the Soviet operations were being closely studied in the hopes of ascertaining what effect, if any, they may be having on the State of Maine inshore sardine herring supply. Other phases of the research studies were described in detail by scientists of the Bureau's biological laboratory. (Maine Sardine Council, Augusta, Me.)



National Fisheries Institute

EXPANDED PROMOTIONAL PROGRAM PLANNED FOR 1966

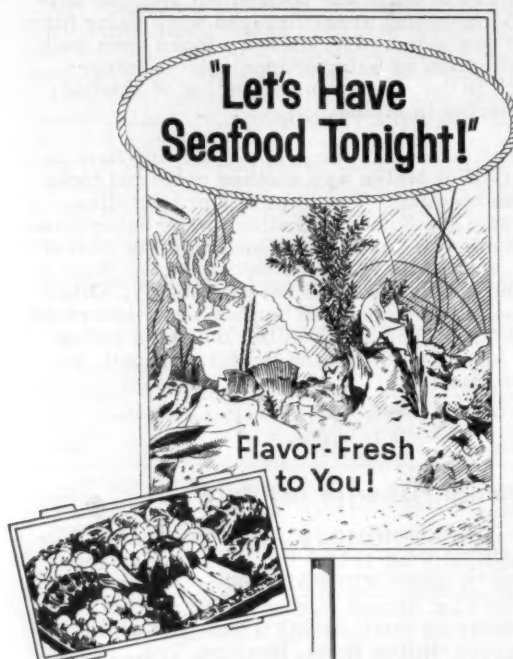
"FISH 'N SEAFOOD PARADE":

The 21st Annual Convention of the National Fisheries Institute (NFI) was held at the Shamrock-Hilton Hotel, Houston, Tex., April 22-26, 1966. The Convention's theme was "Yesterday is History--Tomorrow is Opportunity." It was the biggest convention in NFI's 21-year history, with attendance topping all previous records.

The general sessions included talks on "Highway to Profits," presenting the fisheries' new and expanded promotional program, and the "Exploding Market," a discussion of the institutional market.

Arthur H. Frohman of Chicago, Ill., the newly elected president of NFI, and former chairman of its Fish 'n Seafoods Promotions Division, said that the economic importance of young people is fully realized. Of the some 4 million people who reach the age of 18 each year, nearly half of them are going to decide whether and how often they buy fishery products. Also to be considered at the other end

of the age spectrum is the number of persons 75 years of age and older, and that this age group will increase by 20 percent between now and 1975. "The great health and longevity benefits of seafood are well known to us. But only by the full force of a determined industry can we realistically stress the national consumption of fish and seafood," he said.



Poster and pole display material for the 1966 national Fish 'n' Seafood Parade.

The "Fish 'n' Seafood Parade" promotional program for 1966 will include something new to give added stimulus to the entire campaign. Two new phases are being inaugurated by the NFI Fish 'n' Seafoods Promotion Division which should be particularly helpful in increasing fishery products sales through retail outlets.

The first phase of the program is the development of a promotional book for distribution to retailers. The book will include theme headers for newspaper ads, in hand lettering and with line art work samples of the headers in 8-, 5-, and 3-column material, as well as in spot color and shading and screening. It will also include examples of how elements can be rearranged to create

store ads with fishery products. With the promotional book, the food-store advertising manager will be in a better position to promote fishery products and tie-in with the national campaign.

The second phase of the program will be a unique trade contest aimed at the Advertising and Merchandising managers of the supermarket chains. All studies show that the homemaker thoroughly reads food store ads. The contest will have full-page ads in which "fish 'n' seafood" will be the dominant theme. This will make the trade much more aware of fishery products and alert the consumer to buy more. NFI members who are sponsoring the program will be identified with the contest. Their representatives will have the opportunity to present the contest to the trade.

These new phases of the program will be backed up by a large food publicity program of pictures, recipes, and articles in all media. Also, there will be trade ads in the retail and mass feeding magazines. A guide book of the entire program will be issued to assist the "Fish 'n' Seafood Parade" committees to take advantage of the expanded 1966 promotional campaign.

All promotions--both national and regional--will have the full cooperation of the U. S. Bureau of Commercial Fisheries, as in the past. The Bureau's field representatives will work closely with committees of businessmen in carrying out their regional promotion programs. Fishery bulletins and cookery leaflets distributed by the U. S. Bureau of Commercial Fisheries will feature the economy and easy availability of fishery products.

Note: Merchandising materials for the promotional campaign may be obtained through local seafood packers and processors.



Nautical Charts

LIST FOR PACIFIC COASTAL WATERS:

The free distribution to mariners of catalogs listing all available nautical charts for use in navigating U. S. Pacific coastal waters from the Mexican to the Canadian border, was announced by the Coast and Geodetic Survey, U. S. Department of Commerce, on April 29, 1966. The catalog for the Pacific coast also includes Hawaii, Guam, and the Samoan Islands.

A catalog will be issued in late summer for Alaskan waters. A similar catalog is already available for the Atlantic and Gulf Coasts, Puerto Rico and the Virgin Islands. The catalogs are accordion-folded, similar in format to road maps.

The catalogs list the numbers of all charts, the areas they cover, chart prices, and the scale of each chart. Both small craft and conventional charts are listed. Small craft chart numbers and the outline of the area covered are shown in green and the conventional nautical charts in magenta and blue. The catalogs also include a list of tide tables, coast pilots (sailing directions), current tables and tidal current charts.

Nautical chart diagrams have been available before, but on a much more limited scale. Information up to now has generally been furnished only for specific areas rather than for entire coasts.

The catalogs are available, in person or by mail, from Coast and Geodetic Survey chart distribution centers at 121 Customhouse, San Francisco, Calif. 94126; 620 Federal Office Building; 90 Church St., New York, N. Y. 10007; and 1125 Commerce Building, Washington, D. C. 20230. A list of the 600 agents who sell nautical charts is also available in a similar format.



North Atlantic Fisheries Investigations

DISTRIBUTION OF LARVAL HERRING IN GULF OF MAINE STUDIED:

M/V "Rorqual" Cruise 2-66 (February 14-March 6, 1966): To determine the distribution of larval herring along the coastal Gulf of Maine was the objective of this cruise by U. S. Department of the Interior's Bureau of Commercial Fisheries research vessel Rorqual. The vessel operated in the coastal area between Cape Ann and Grand Manan Channel.

BIOLOGICAL OBSERVATIONS: Fifty stations were occupied. Three-mile oblique tows were made at each station using the Boothbay trawl no. 4. One oblique tow with a Gulf III sampler was made in the Grand Manan Channel.

PRELIMINARY FINDINGS: Some 1,912 larval herring were caught ranging in stand-

ard length from 17 to 46 mm. The heaviest concentrations were found in Ipswich Bay and off Bluehill, Frenchmans, and Pleasant Bays. Mean lengths were generally larger in the west and east and smallest near Penobscot Bay. The largest mean length was from a catch off Machias Bay.

Surface temperatures and salinities were taken at each station. Five drift bottles and five sea-bed drifters were released at 21 standard stations. A Nansen bottle cast, a bathythermograph cast, and a Secchi disc reading were taken at the Grand Manan station.

Note: See Commercial Fisheries Review, January 1966 p. 42.



North Pacific Fisheries Explorations and Gear Development

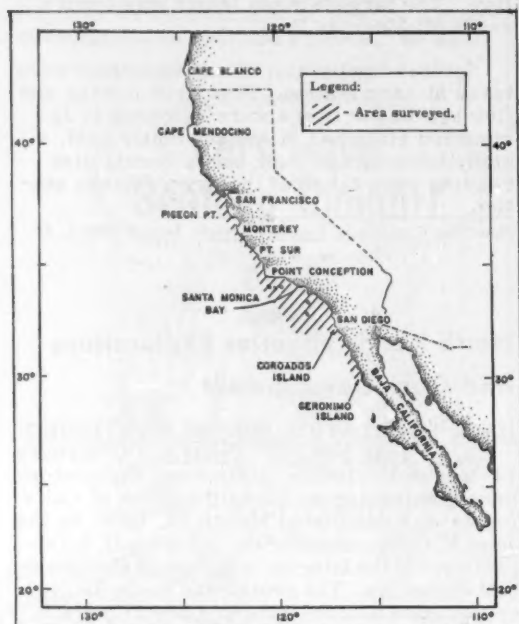
HAKE POPULATION SURVEY CONTINUED:

M/V "John N. Cobb" Cruise 76 (February 14-March 25, 1966): A six-week exploratory hake-fishing survey along the coast of California was completed March 25, 1966, by the John N. Cobb, research vessel of the U. S. Department of the Interior's Bureau of Commercial Fisheries. The cruise was conducted in cooperation with the Bureau's Seattle and La Jolla Biological Laboratories, Seattle Technological Laboratory, and the California Department of Fish and Game.

Objectives of the cruise were to: (1) determine the geographic and bathymetric distribution of schools of Pacific hake (Merluccius productus) with the major emphasis on locating and sampling spawning hake concentrations; (2) obtain biological data on hake; and (3) obtain additional data relative to the catching efficiency of the "Cobb" pelagic trawl.

The principal gear used was a standard "Cobb" pelagic trawl constructed of 3-inch mesh multifilament webbing. It was fished with the standard two aluminum hydrofoil-type otter boards on 30-fathom bridles. A high-resolution, low-frequency echo sounder was used to locate the fish and a dual electrical depth telemetering system was used to monitor the fishing depth of the net. An experimental anchovy trawl was also used in the latter part of the cruise. This net is fished in the same manner as the "Cobb" pelagic trawl, and it is constructed of $\frac{3}{4}$ -inch number 9 thread, knotted multifilament nylon.

Echo-sounding transects were conducted in accordance with information gained from preliminary hake egg and larvae surveys. Traces of fish observed on the sounder were fished with the "Cobb" pelagic trawl.



Area surveyed during Cruise 76 of the M/V John N. Cobb (February 14-March 25, 1966).

The Scripps Institute of Oceanography's research vessel Alexander Agassiz conducted hake egg and larvae surveys in conjunction with the Bureau vessel's cruise to help locate spawning schools of hake. The Institute's vessel surveyed the area from Point Conception, Calif., to Geronimo Island, Baja California. A number of stations in the northern sector yielded fair catches of hake eggs and larvae.

The John N. Cobb sounded the coastal waters from San Francisco to Geronimo Island, mainly in the waters between Point Conception and San Diego. The stations where the eggs and larvae were found were surveyed in detail as well as the area off Coronado Islands, where hake were found during 1965, but no adult concentrations were located.

Good signs of fish were observed off Point Sur and Monterey Bay. They were about 125 to 150 fathoms below the surface and over a

bottom depth that ranged from 300 to 600 fathoms. But the weather was such that no hauls were made.

The only other distinct sign of fish observed during the cruise was in Santa Monica Bay. The trace was fair, but the size of the school was small, 1 to 3 miles in length and width. They were located at a depth of 110 fathoms, over a bottom depth of 150 fathoms.

Two 1-hour hauls were made through that school, which yielded 50 and 100 pounds of small immature hake. Those fish ranged from 13 to 29 centimeters (5.1-11.4 inches).

The school was observed with the echosounder throughout the afternoon and evening; it rose in the evening and dispersed. The following morning it was relocated in approximately the same place after sunrise.

A port call was made in San Francisco on the return trip to Seattle. Representatives of a fishing company there supplied samples of hake caught by a local trawler. The fish, which were large and spawned out, were taken off Pidgeon Point in 145 to 150 fathoms of water, and the tracing of the echogram was excellent. This seemed to be the time of year the hake start appearing in the San Francisco area.

The research vessel Alaska of the California Department of Fish and Game was scheduled to work in conjunction with the Bureau's vessels in fishing and locating hake. But a leak occurred in their fuel tanks and they were in the shipyard during most of the cruise. During part of the week of March 14-18 the two vessels worked together in scouting for fish and comparing sounding traces.

Note: See Commercial Fisheries Review, April 1966 p. 29.



Oceanography

NEW RESEARCH VESSEL "OCEANOGRAPHER" DELIVERED TO GOVERNMENT:

The Oceanographer, the largest, most modern and completely automated vessel built in the United States to probe the secrets of the oceans was delivered to the Federal Government on April 26, 1966.

Delivery of the \$7 million "floating laboratory," the most advanced vessel of its kind in

the world, was accepted on behalf of the Government by the Maritime Administration, U. S. Department of Commerce, which designed it and supervised its construction. It will be operated by the Coast and Geodetic Survey.

The Oceanographer brought to 14 the number of vessels in the fleet of the Coast and Geodetic Survey, an agency of the Commerce Department's new Environmental Science Services Administration. It is the largest vessel ever built in the United States for the express purpose of deep-sea oceanographic surveys and research. It will be followed later this year by a sistership, the Discoverer.

The Oceanographer is constructed so that it can operate equally well in any area of the global sea, including waters of the Arctic and Antarctic. A bow thruster of 400 hp. located in a transverse tunnel through the vessel's hull enables it to maintain a constant heading at low speeds despite wind and wave conditions. The vessel's specialized equipment permits extensive oceanographic, meteorological and marine geophysical research. (U.S. Department of Commerce, April 26, 1966.)

Note: See Commercial Fisheries Review, January 1966 p. 45.

NEW HYDROGRAPHIC VESSEL LAUNCHED FOR U. S. COAST AND GEODETIC SURVEY:

A new hydrographic survey vessel, the Davidson, of the Coast and Geodetic Survey, U. S. Department of Commerce, was launched May 7, 1966, at Norfolk, Va.

The Davidson is named for George Davidson, a 19th century geodesist, geographer, and astronomer of the Coast and Geodetic Survey, sometimes referred to as "the father of Pacific Coast geography."

The Davidson's keel was laid November 22, 1965, and the vessel is scheduled for completion early in 1967. Following commissioning, she will become part of the Coast and Geodetic Survey's expanding fleet, which now consists of 14 vessels. They survey coastal waters, search for underwater navigational hazards, make gravity and magnetic measurements, conduct tidal and tidal current surveys, and engage in deep sea oceanographic surveys and research.

The Davidson is being equipped with specialized depth recorders and positioning sys-

tems. She is being built of welded steel construction strengthened for navigation in ice and will be propelled by diesel engines, with twin-screw, reversible-pitch propellers. The vessel will have accommodations for 6 officers and a crew of 30.

While the Davidson will engage primarily in hydrographic surveys, she will also have limited oceanographic facilities. The ship is designed for hydrographic coastal surveying, including the setting up and support of shore parties.

Officers who man the Davidson will be commissioned personnel of the Environmental Science Services Administration (ESSA). Last year, the commissioned corps of the Coast and Geodetic Survey became a part of ESSA, a new Commerce Department bureau formed by the amalgamation of the Coast and Geodetic Survey, the Weather Bureau, and the National Bureau of Standards' Central Radio Propagation Laboratory, to serve as the national focus for the study of environmental problems.

The Davidson is a sistership of the McArthur, which was launched at Norfolk November 15, 1965. (U. S. Department of Commerce, May 7, 1966.)



Oregon

STEELHEAD STOCKING PROGRAM:

Liberation into the Willamette River system above Willamette Falls of 55,000 steelhead smolts from the Oregon Fish Commission's Big Creek hatchery near Astoria was scheduled for completion in early April 1966, according to the Commission. The Oregon Game Commission, cooperating in the project, furnished supplemental trucks and drivers to help haul the fish to the upriver planting sites. Among the streams receiving Big Creek steelhead were the South Yamhill River, Willamina Creek, Agency Creek, North Yamhill River, and Mill Creek near Buell. This is the second year of the program which has as its objective the establishment of a steelhead run in the Yamhill River system. Last year 45,000 yearlings were released into South Yamhill tributaries.

The young steelhead measure from 7 to 8 inches in length and are ready, after a year of rearing at Big Creek hatchery, to migrate

to the ocean. The survivors will return as adults on their initial spawning run during the late fall and winter of 1967/68. Although they were reared at Big Creek, the transplanted fish will return to the streams in which they were liberated and from which they began the long trip to the ocean. Enthusiastic about the fine physical condition of the fish, the Commission predicted that returns from the current liberations could be excellent. Returning adults from this plant, due back during the 1967/68 season, will have the benefit of the new Willamette Falls ladder.

An additional 55,000 yearlings reared at Big Creek, a lower Columbia River tributary, were scheduled for liberation into the hatchery stream in late April. The Commission said 4,169 adult steelhead returned to Big Creek hatchery in the past season. Eggs were taken from 200 females to supply fish cultural needs and 116 females plus a like number of adult males were transported with a Game Commission truck to the North Yamhill River and liberated to help build up the run in that stream. The remaining 3,000 adults were allowed to pass upstream to spawn naturally in Big Creek.

The egg take this season totaled 702,000, some 115,000 more than last year's 587,000 take. During recent years, steelhead eggs surplus to the Big Creek hatchery's requirements were transferred to other Commission hatcheries and, this year, to the Federal hatchery on Eagle Creek near Estacada.

A check on sport fishing activities in the northwestern Oregon area, revealed that no regular creel census is conducted on Big Creek as there is on some Oregon Streams. Based on frequent checks of anglers during the season, however, it was estimated that at least 50 steelhead a day were taken from a $\frac{1}{4}$ -mile section of the stream during the 3- to 4-week peak of the steelhead season. Large numbers of steelhead were also caught in other portions of the stream.

The fish culture director commented that they were well pleased with the steelhead program at the Big Creek hatchery. Heavy returns of coho indicated the Big Creek station was doing mighty well in the salmon department also. (Oregon Fish Commission, April 1, 1966.)

Note: See Commercial Fisheries Review, July 1965 p. 43.

WILLAMETTE FALLS STEELHEAD COUNT HIGH:

It appeared certain that the spring migration of steelhead in the Willamette River in 1966 would go on the books as the best in the 16 years that the upstream-bound steelhead have been tabulated at the Willamette Falls fishway, according to the project leader of the Oregon Fish Commission's Columbia River fishery development program. As of mid-April, more than 7,000 steelhead had negotiated the ladder. The 1957 count, the closest to this year's record, was several hundred fish lower, with 5,456 steelhead actually counted. The counting is done by an observer stationed at the upper end of the fishway. He counts 50 minutes out of each hour, with a 5-minute rest period between each half-hour session. Tabulation is conducted essentially during daylight hours with some periods of night observation to provide a basis for calculating the total run. Allowances are also made for the number of fish passing during the 10 minutes of each hour the observer is off duty.

The peak of the steelhead movement this season was on April 5 and 6 when 1,073 and 1,567 steelhead, respectively, passed the falls, the project leader said. With a record high already listed as of those dates, the count was expected to continue to climb by 100-200 fish a day for two weeks more. Spring chinook movement over the falls was just starting and was expected to build up over the following few weeks to reach a peak sometime during May. High water during the March 4 to April 1 period prevented any large number of steelhead from ascending the fishway. High flows also prevented Commission personnel from reaching the counting station on the west side of the falls.

Large numbers of steelhead fry, smolts, and adults have been liberated into the system during recent years by both the Fish and Game Commissions. Although the precise degree of contribution of these efforts is not known, these plants have undoubtedly had some effect on the 1966 run, and quite possibly, have substantially supplemented naturally produced fish.

At any rate, the steelhead picture in the Willamette system was viewed as most encouraging. By the time of completion of the new Willamette Falls fishway, it was believed, there could well be a heavy traffic of steelhead to put the facility to good use. (Oregon Fish Commission, April 12, 1966.)

INDIAN FISHERY IN COLUMBIA RIVER SURVEYED:

The Oregon State University was awarded a contract, by the U. S. Department of the Interior for a survey to determine the magnitude of the Indian fishery in the Columbia River. The \$25,000 survey is financed jointly by the Bureau of Indian Affairs and by the Bureau of Commercial Fisheries.

Approximately 1 percent of the adult chinook salmon passing Bonneville Dam were to be tagged this past spring and cash rewards of \$1 to \$50 were to be paid to Indians who caught the marked fish and returned the tags. Tagging of the salmon at Bonneville began April 1.

The extent of the Indian fishery was to be calculated from the number of tags returned.

"The purpose of the survey is to provide an accurate picture of how extensive the Indian fishery is in the Columbia River," said Dr. L. Edward Perry, Director of the Bureau of Commercial Fisheries Columbia River Program Office. The survey is part of an overall program to find out the magnitude of the non-Indian as well as the Indian fishery. The Bureau already has in operation an extensive evaluation program known as "Operation Fin Clip" to measure the contribution of fish hatcheries in that area to the total sport and commercial catch.

Under terms of the Oregon State University contract, Indians who caught tagged salmon above Bonneville Dam could collect their reward by returning the tags to a collecting station.

In order to get the reward, the Indian presenting the tag was required to state where he caught the tagged fish.

Note: See Commercial Fisheries Review, May 1966 p. 21.

SALMON HATCHERY CONSTRUCTION CONTRACT AWARDED:

A contract to construct a salmon hatchery on the North Fork of the Nehalem River (Oregon) was awarded to a firm in Portland by the Oregon Fish Commission in late April 1966. The 15 proposals submitted to the Commission ranged from \$276,912 to \$390,648. The contract was given to the low bidder.

Under terms of the agreement the contractor will have 160 days to complete the job.

The initial project calls for construction of rearing ponds, water supply systems, egg collection facilities, a service building, and gravel roads. A second construction contract to include 3 dwellings was expected to be advertised late in June.

The new facility, not yet formally named, will be located on the south bank of the North Fork of the Nehalem River about 8 miles south of Necanicum Junction on Oregon Highway 53 in Clatsop County. Initial plans call for annual production of 1 million yearling silver (coho) and 1 million 90-day reared fall chinook.

With official approval of the construction contract, the Oregon Fish Commission adds another modern hatchery to its string of fish-production facilities. This latest salmon hatchery will pump new life into the old Nehalem, as well as help boost the offshore sport and commercial fisheries. (Oregon Fish Commission, April 15, 1966.)

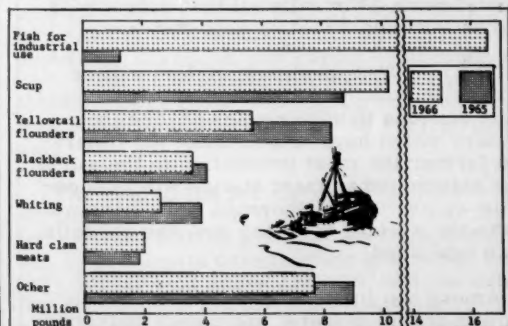


Rhode Island

FISHERY LANDINGS, 1965:

Landings of fish and shellfish at Rhode Island ports during 1965 were 48.1 million pounds valued at \$4.5 million. Compared with 1964, this was an increase of 30 percent in quantity and 20 percent in value. The catch used for industrial purposes was up 15.3 million pounds.

The catch by otter trawls, as usual, accounted for the major quantity and value of the State's landings, and in 1965 represented 75 percent of the quantity and 51 percent of the value. The otter trawl lobster catch was al-



Rhode Island landings of certain species, 1965 and 1964.

most double the quantity taken a year ago, and while representing only about 4 percent of the volume accounted for 38 percent of the total value for the 1965 otter-trawl catch. Industrial fish taken by that gear was over 15 million pounds greater than the previous year. That figure represented landings during the last 4 months of 1965 when the renovated fish meal plant at Point Judith operated.

Floating trap catches added up to another record year, the fourth in a row. Scup made up 83 percent of the total catch by floating traps. The fishery is primarily seasonal with most of the catch being made in the spring of the year. During May, 65 percent of the total 1965 trap catch was made.

Hard clam (quahog) production increased 11 percent over 1964 with the catch by hand tongers and rakers down 3 percent while dredge production was up 79 percent.

MARINE EXPERIMENT STATION TO BE ESTABLISHED BY UNIVERSITY OF RHODE ISLAND:

The establishment of a marine experiment station within the Graduate School of Oceanography at the University of Rhode Island has been approved, announced the dean of the School, April 8, 1966. The University has been seeking state-owned land for construction of a small building which would house the station and provide quarters for an initial program in shellfish culture. Preliminary discussions were held with the Director of the Rhode Island Department of Natural Resources. It was indicated that the state would be willing to enter into an agreement to allow the University exclusive use of 200 acres of land in Jerusalem, R. I., for experimental work. Virtually all that property is marsh land and would be kept that way.

The marine experiment station will be similar in concept to the agricultural experiment stations in universities across the country which have helped make the American farmer the most productive in the world. The marine experiment station will concentrate on assisting fishermen and others who make their living from the sea, the School's dean explained.

Among the first projects will be one to grow quahogs, oysters, and clams under con-

trolled conditions in Potter and Pt. Judith Ponds. In addition, a continuing study will be made of the fish and other life in the marsh.

The station will be headed by Saul B. Salla, associate professor of oceanography who has been a member of the University of Rhode Island faculty since 1956. (University of Rhode Island, April 8, 1966.)



Salmon

U. S. PACIFIC COAST CANNED STOCKS, MARCH 1, 1966:

On March 1, 1966, canners' stocks (sold and unsold) in the United States of Pacific canned salmon totaled 1,485,947 standard cases (48 1-lb. cans)--427,833 cases less than on February 1, 1966, and 480,240 cases less than on March 1, 1965, when stocks totaled 1,966,187 standard cases.

On the basis of total stocks of 2,010,097 actual cases (consisting of cans of $\frac{1}{4}$ -lb., $\frac{1}{2}$ -lb., 1-lb., etc.), red salmon accounted for 1,315,770 cases (mostly 1-lb. and $\frac{1}{2}$ -lb. cans) or 65.5 percent of the total canners' stocks on March 1, 1966; pink salmon accounted for 365,595 cases or only 18.2 percent (227,414 cases were 1-lb. talls). Next came chum (142,969 cases, mostly 1-lb. talls), followed by coho or silver (119,342 cases), and king salmon (66,421 cases).

Table 1 - Total Canners' Stocks of Pacific Canned Salmon, March 1, 1966			
Species	Mar. 1, 1966	Feb. 1, 1966	Jan. 1, 1966
(No. of Actual Cases).....		
King	66,421	87,321	109,284
Red	1,315,770	1,553,294	1,801,354
Coho	119,342	155,072	173,560
Pink	365,595	520,292	651,279
Chum	142,969	201,711	263,268
Total	2,010,097	2,517,690	2,998,745

Carryover stocks at the canners' level totaled 733,575 standard cases on July 1, 1965, the approximate opening date of the Pacific salmon-packing season. Adding the 1965 new season pack of 3,541,187 standard cases brought the total available supply for the 1965/66 market season to 4,274,762 standard cases.

Shipments at the canners' level of all salmon species from July 1, 1965, to March 1,

Table 2 - Total Stocks on Hand March 1, 1966 (Sold and Unsold) by Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
			(Actual Cases)			
48 $\frac{1}{4}$ -lb.	3,774	161,449	51,937	2,480	66	219,706
48 $\frac{1}{2}$ -lb.	58,176	455,052	42,824	128,973	33,717	718,742
48 1-lb.	4,174	695,549	19,850	227,414	104,673	1,051,660
12 4-lb.	297	3,720	4,731	6,728	4,513	19,989
Total	66,421	1,315,770	119,342	365,595	142,969	2,010,097

Table 3 - Cannery Shipments from July 1, 1965 to March 1, 1966 by Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
			(Actual Cases)			
48 $\frac{1}{4}$ -lb.	10,426	263,599	72,901	6,013	1	352,940
48 $\frac{1}{2}$ -lb.	110,676	527,963	89,724	283,367	60,375	1,072,105
48 1-lb.	16,557	765,074	88,250	822,223	393,870	2,085,974
12 4-lb.	42	5,739	9,538	51,211	12,108	78,554
Total	137,617	1,562,375	260,413	1,162,814	466,354	3,589,573

1966, totaled 2,788,815 standard cases. The carryover of 733,575 standard cases on July 1, 1965, the beginning of the 1965/66 sales year, was substantially lower (37.6 percent) than the carryover of 1,175,588 cases a year earlier.

The 1965 U. S. pack of Pacific canned salmon (including Alaska) of 3,672,435 standard cases was 2.3 percent below the 1964 pack of 3,759,198 cases. By species, the new pack was made up of (1964 pack in parentheses): king, 130,556 standard cases (95,804); red, 2,051,667 cases (776,894); coho, 176,391 cases (219,066); pink, 998,552 cases (1,940,061); chum, 311,522 cases (724,459); steelhead, 3,747 cases (2,914).

Data on canned salmon stocks are based on reports from U.S. Pacific Coast canners who packed over 97 percent of the 1965 salmon pack. (Division of Statistics and Economics, National Canners Association, April 2, 1966.)

Note: See *Commercial Fisheries Review*, May 1966 p. 31.



Shellfish Farming

POTENTIAL ALONG U. S. EAST COAST:

Profitable shellfish farming can become a reality along the United States east coast within five years, according to the chairman of the University of Rhode Island's Marine Resources program. Writing in the official quarterly publication of the University's

Graduate School of Oceanography, he said this goal can be achieved through careful management backed by scientific knowledge.

The University chairman said there are about a dozen exploratory shellfish farms operating in southern New England and New York. He termed this shellfish farming "aquaculture," and said research in this area was in progress at the University of Rhode Island.



Shrimp

U. S. CONSUMPTION UP IN 1965:

U. S. consumption of shrimp in all forms was estimated at 323 million pounds (heads-off weight) in 1965, a sharp increase of 8 percent over 1964. Shrimp consumption has risen for three consecutive years, and in 1965 was 2.3 times greater than in 1950. With the increase in total consumption well above the population increase, per capita consumption rose from 1.56 pounds in 1964 to 1.67 pounds (heads-off) in 1965. Per capita consumption was 27 percent greater than the 1957-59 average.

The rise in the per capita consumption of shrimp has been much greater than that for food and all fish as a whole. In 1965, the index of per capita consumption of all food was only 1.1 percent above 1957-59, and the index for all fish was unchanged.

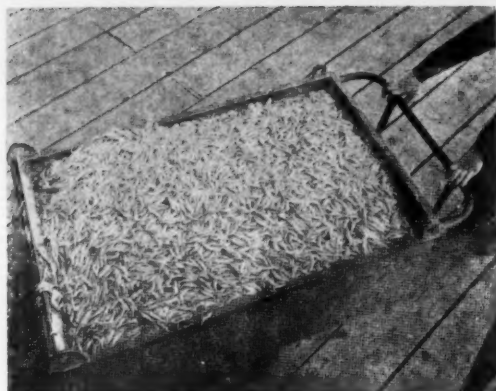


Fig. 1 - Shrimp being transported from landing dock to processing plant.

Ordinarily, the consumption of a commodity will increase with a decline in its price relative to prices of competing products. Last year was a good example: Although the price of fresh and frozen shrimp averaged 4 percent higher than 1964, the increase was less than the price rise for scallops, lobsters, spiny lobster tails, oysters, and most other shellfish. Shrimp may also have benefited from higher prices for meat products last year. Reduced supplies of meat resulted in 4 percent higher retail prices and a 2-percent per capita reduction in consumption of all meat products.



Fig. 2 - Tempting shrimp salad ready for serving.

Rising incomes have been an important factor in the postwar increase in shrimp consumption. Since 1950, for example, per capita consumption of shrimp has trended upward at a rate of 2.8 percent per year, even though the average retail price advanced at a rate of 2.25 percent per year. (U.S. De-

partment of the Interior, Bureau of Commercial Fisheries, Branch of Current Economic Analysis.)



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JANUARY-MARCH 1966:

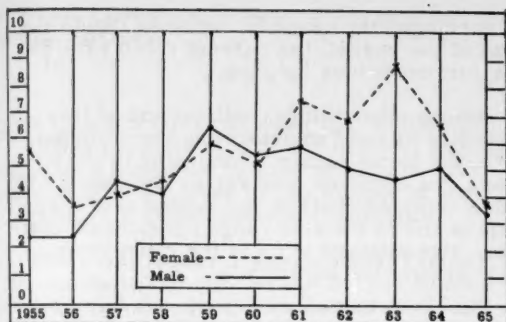
A report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for January-March 1966, follows:

Oyster Studies: The State-Federal oyster project continued to locate and chart subtidal oyster beds, and has very carefully charted 45 linear miles in Colleton, Charleston, and Berkeley Counties. Transplanting of seed oysters from deep-water beds in the Wando River to the Stono and Ashepoo Rivers was carried out during the quarter. Detailed studies of small creeks in the vicinity of McClellanville, to which oysters have been successfully transplanted in the past, were studied in order to try to determine the environmental factors which may control successful transplanting. Quite a number of bottom samples were sent to the State Geologist for analyses.

A repeat survey of 8 stations in the vicinity of Folly River was completed. Those stations were surveyed in 1960 and in 1961, and now in 1966. Comparison of the surveys show that the total number of all sized oysters found in one square yard has steadily declined. The percentage of oysters in each size group has changed. In the 1960 and 1961 surveys small oysters (seed and canning stock) made up about 70 percent of the total population. In 1966, only 50 percent of the oysters were in this size group. This may indicate either heavy harvesting of this size oyster or a lack of recruitment. In 1960 and in 1961, the 2- to 3-inch size oysters made up 20 percent of the oysters taken in sampling. In 1966 this ratio increased to 35 percent. The most striking change occurred in the large (usually single) oysters 3 inches or more in length. The populations in 1960 and in 1961 contained only 6 percent and 7 percent, respectively, of that size. However, in 1966 there were 16 percent of the oysters of that size. Apparently these larger oysters are being underharvested.

Pesticides: The pesticide monitoring program showed that the DDT residuals in fish were 86 percent higher in January and February than during the previous quarter. Dieldrin residuals showed even a higher increase than DDT. Four of the 5 sampling stations which showed this accretion were in the Charleston Harbor area. Oysters were not contaminated by Dieldrin or DDT, except those which were taken from the Ashley River.

Crab Studies: In 10 years of experimental trawling throughout the States, 38,678 crabs were taken in 1,920 tows, according to a study completed in this quarter on available crab information at Bears Bluff Laboratories. The accumulated data show that the sex ratio on these crabs was 77 males to 100 females. Fluctuations in the relative abundance of blue crabs throughout South



Relative abundance of mature male and female blue crabs at 18 regular experimental stations throughout South Carolina, 1955-65.

Carolina as determined by this study are shown in detail (see fig.).

Sampling population densities by the use of crab pots in three different areas of the State, but which were comparable in general physical characteristics, showed that the same amount of effort (i.e. the same number of pots, set the same length of time, using the same type of bait, in approximately the same depth of water) yielded the highest catch in the central, or

date, shrimp were found to be fairly abundant in the ocean just off the mouth of the river, where the water temperature was 44.6° F. But within a few days, white shrimp became scarce at all sampling locations.

The extent of the effect of the cold wave on the white shrimp population is not known with certainty, but a few dead shrimp were found in the Charleston Harbor area in February, and several reports were made of shrimp being killed by cold in small creeks. Even though the three-month average catch for white shrimp (see table) was considerable higher this year than in 1965 (due to the high January catch) the abundance of these shrimp in February and March of 1966 was much lower than in 1965. During February the average catch per unit of effort for white shrimp dropped to about 5.0 and in March it declined to 2.0, whereas in 1965 during the same two months the average CPUE was 8.0 and 11.0.

The fact that some shrimp still remain in coastal waters is encouraging, but the outlook for white shrimp is not nearly as promising as it was earlier.

Spot and croaker were less plentiful in experimental trawling during January-March 1966 as compared with the same period of 1965 (see table). Judging from the numbers of postlarvae of those fish in plankton collections made so far in 1966, it appears that both species had successful spawning seasons this past winter and will be quite abundant later on in the year.

Average Catch Per Unit of Effort of Commercial Species at Regular Survey Stations, January-March 1962-1966

Year	Spot	Croaker	White Shrimp				Blue Crab	
			Jan.	Feb.	Mar.	3 Mos.	Mature	Immature
1966	2.9	4.1	228.6	5.3	2.0	78.8	6.9	6.2
1965	7.2	5.7	28.7	8.0	10.9	45.7	6.2	12.0
1964	0.7	9.5	0.3	0.0	0.0	0.1	3.2	9.4
1963	7.9	10.2	9.6	0.0	0.0	3.2	8.1	8.6
1962	22.1	18.6	23.4	35.8	19.1	26.3	14.1	23.9

Price Inlet area. The northern or Murrells Inlet area produced only 80 percent as much as the Harbor River, or southern area, yielded only 36 percent of the number caught in the Price Inlet area. This type of population sampling will continue in those three areas for 12 months and may give general information on the three regions, which differ considerably as to fishing pressure.

According to information obtained by experimental trawling throughout the State by the research vessel, adult blue crabs were of about the same abundance in experimental trawling during January-March 1966 as in the same quarter of 1965 (see table). Immature blue crabs, however, were only about one half as numerous during the quarter as in 1965. This may be due to the lower water temperatures observed this year. By late March the numbers of both immature and mature blue crabs began to increase with rising water temperatures.

Shrimp Studies: Small white shrimp were very plentiful throughout coastal waters during January 1966, and an average catch of over 225 in each 20-minute drag with a 20-foot net was recorded at regular survey stations. During the last week of January, however, a sudden cold wave sent air temperatures down to 11° F., and water temperatures in sounds and rivers dropped into the low 40's. On January 31, water temperature was 41° F. in the North Edisto River and almost no shrimp were found there. On the same

Brown shrimp postlarvae began to enter coastal waters somewhat later this year than in 1965, and it was mid-February before they began to show up in plankton collections. Lower water temperatures during the past winter are quite possibly responsible for the later appearance of these postlarvae this year. Peak abundance of postlarval brown shrimp as of this quarter occurred from middle to late March, and additional recruitment during April was expected.

Pond Cultivation: During the extreme cold spell which occurred in late January and early February 1966, a fish kill took place in a 2½-acre experimental pond. The water temperature at the time of the kill was 33.4° F. Most of the winter trout and croaker in the pond succumbed to cold, but some spot and practically all of the channel bass in the pond revived when temperatures rose a few days later. Most of the channel bass were 2- to 3-year old fish ranging in length from 18-27 inches. Mortality among mullet and flounder in the pond was also negligible.

Two experimental shrimp ponds of $\frac{1}{10}$ and 1 acre in size were drained and treated with triple superphosphate fertilizer at the rate of 40 pounds P_2O_5 per acre. This was done to determine whether added phosphate will increase the productivity of shrimp in ponds. In a preliminary experiment conducted in heated concrete tanks during the quarter, the mud bottom of one tank was treated with phosphate fertilizer, and the other was kept untreated. Both tanks were stocked with small

white shrimp which were fed the equivalent of 2,500 pounds of food per acre during a 2½-month period. Although growth was not extraordinary in either tank, the mortality in the phosphate treated tank was much less than in the untreated control. Reduced mortality through the use of fertilizers has been reported for fish in brackish water ponds in the Far East, and results indicate that the same may hold true for shrimp in ponds.

Note: See Commercial Fisheries Review, March 1966 p. 34.



Tuna

ECONOMIC STUDY OF TUNA FISHING BY U.S. BUREAU OF COMMERCIAL FISHERIES:

Recent changes in the efficiency and composition of the California-based tuna fishing fleet, along with the trend toward building more and larger tuna purse seiners has pointed up the need for a detailed analysis of the economics of United States tuna fishing in the eastern tropical Pacific Ocean. Such an analysis entitled "Costs and Earnings of Tropical Tuna Vessels Based in California" has been published in Fishery Industrial Research, Vol. 3, No. 1, a publication of the U.S. Department of the Interior's Bureau of Commercial Fisheries.

The study was made by a fishery biologist of the Bureau's Tuna Resources Laboratory, La Jolla California, in collaboration with an analyst of a California tuna-packing firm who was formerly associated with the Inter-American Tropical Tuna Commission.

The authors present a method of estimating earnings of various size purse seiners in the size range of 100- to 500-ton capacity, under any prevailing catch rate and price structure for yellowfin and skipjack tuna. Earnings are examined from the standpoints of both vessel owner and crew.

Costs of operation for a substantial portion of the California-based tuna fleet obtained by the authors were broken down into individual categories, and examined in each category in relation to vessel size. These were then recombined according to vessel size, with other information relating directly to vessel income. The income data included the varying prices and catch rates for tuna, relative efficiency of different sizes of vessels, average days at sea per year, average capacity filled, and the average proportions of the two species in the annual catch; again related to vessel size. Using these data, the article shows in considerable detail how estimations

of earnings may be made, using as inputs the size of the vessel, the current catch rate, and the current prices for tuna.

Among other things, estimations of this type may be used to determine the optimum size of a purse seiner. According to the authors, the optimum size varies somewhat with catch rates and prices, but, under recent conditions and in the size range considered, optimum size appears to be in the range from 350- to 500- ton capacity.

The study has already proved to be of considerable interest to the fishing industry.



United States Fisheries

FISH CONSUMPTION IN 1965 HIGHEST IN TEN YEARS:

Preliminary data for 1965 indicate that per capita consumption in the United States of commercially-caught fish and shellfish amounted to 11.0 pounds, edible weight--up from 10.5 pounds in 1964 and 10.6 in 1963. The 1965 per capita fish consumption was



the highest since 1954 when 11.2 pounds were consumed at considerably lower prices. The increased consumption did not occur because of lower prices, as the 1965 retail fish price index was at its highest level at 110.6. The retail fish price index was 95.8 in 1954 and 107.4 in 1964. The increased consumption in 1965 resulted largely from a greater consumption of canned fishery products--4.4 pounds in 1965 compared with 4.1 in 1964. The consumption of fresh and frozen fishery products in 1965 amounted to 6.1 pounds per person--up 0.2 pounds from a year earlier. Cured products were consumed at the rate of ½-pound per person, the same as in 1964. Part of the increased consumption came from decreases in some storage stocks. (U. S. Department of the Interior, Bureau of Com-

mercial Fisheries, Branch of Current Economic Analysis.)

1963 CENSUS OF COMMERCIAL FISHERIES:

Gross receipts of U.S. commercial fishing operators amounted to \$339 million in 1963, according to a survey by the Bureau of the Census, U.S. Department of Commerce.

The 1963 Census of Commercial Fisheries, conducted by the Census Bureau in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, is the first survey since 1908.

There were 23,249 operators engaged in commercial fishing in 1963. Of that total, 13,998 had no paid employees. The remaining 9,251 operators had 20,300 employees with a 1963 payroll of \$102 million. Only 82 had 20 or more paid employees and only 3 had more than 100.

The Pacific area with 8,601 operators and gross receipts of \$128.5 million, topped the nation. In second place was the South Atlantic area with 6,338 operators and gross receipts of \$65 million, followed by the New England area with 3,199 operators and gross receipts of \$56 million.

There were 10,666 vessels engaged in commercial fishing in 1963, of which 8,095 were 30-59 feet in length. Only 196 exceeded 120 feet.

LANDINGS AND VALUE OF COMMERCIAL FISHERIES HIGHER IN 1965:

United States fishery landings in 1965 totaled 4.7 billion pounds (4 percent higher than in 1964) with a record ex-vessel value of \$451 million--almost 16 percent more than the \$390 million value in 1964, the U. S. Department of the Interior's Bureau of Commercial Fisheries said. Per capita consumption of fishery products in the United States of 11.0 pounds was one-half pound more than in 1964. Most of the gain was attributed to tuna.

The United States remained fifth among the world's fishing nations, led by Peru, Japan, Mainland China, and the Soviet Union in that order. For the first time the United States imported (principally from Canada, Japan, Mexico, Peru, Iceland, and Norway)

more than half its supply of edible fishery products.

Shrimp was again the most valuable species--the 1965 catch had an ex-vessel value of \$82 million. The salmon catch was valued at \$67 million, and tuna at \$42 million.



Fig. 1 - Heading of shrimp aboard a fishing vessel.

New catch records were set for Atlantic and Pacific flounders, spiny lobsters, blue crabs, and Alaska king crabs. Spiny lobsters are the source of what many consumers purchase as "lobster tails." The increase in the catch of Alaska king crab was greater than the total catch of that species just five years ago.

Menhaden (an inedible species), which is made into fish meal and used for poultry feed, oil, and other commercial products, was again the most abundant fish taken by United States



Fig. 2 - Menhaden being conveyed on belt system from the hold of a vessel to the cookers of a reduction plant on the east coast of the United States.

fishermen, accounting for 36 percent of the total catch (or 1.7 billion pounds).

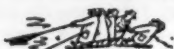
Declines were noted in several species, among them mackerel taken off the coast of California, and Atlantic ocean perch. Sardines--at one time the largest fishery with well over a billion pounds landed annually--virtually disappeared from waters off the Pacific Coast.

The Nation's oyster industry also declined. The 54-million-pound catch in 1965 was down 6.7 million pounds from 1964 and was the lowest on record; oyster landings were up in Maryland, but down sharply in New Jersey, Virginia, Alabama, Mississippi, and Louisiana.

Louisiana again led all states in the volume of catch in 1965--794 million pounds--followed by Alaska, Virginia, California, and Massachusetts. Menhaden accounted for a large part of the Louisiana landings.

Alaska continued to lead all states in value of catch--\$72 million--followed by California, Massachusetts, and Louisiana. Salmon and king crab made up a major portion of the Alaska catch.

Note: See Commercial Fisheries Review, April 1965 p. 38.



U. S. Fishing Vessels

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, JANUARY 1-MARCH 31, 1966:

From the beginning of the program in 1956 through March 31, 1966, a total of 1,792 applications for \$45,695,111 was received by the Bureau of Commercial Fisheries, U. S. Department of the Interior, the agency administering the Federal Fisheries Loan Fund. By that date, 930 applications (\$20,239,076) had been approved, 575 (\$13,323,939) had been declined or found ineligible, 242 (\$8,730,158) had been withdrawn by the applicants before being processed, and 45 (\$1,338,599) were pending. Of the applications approved, 338 were approved for amounts less than applied for--the total reduction was \$2,063,339.

The following loans were approved from January 1, 1966, through March 31, 1966:

New England Area: Sigvald Osmundsen, Rio Grande, New Jersey, \$9,000.

South Atlantic and Gulf Area: Merlin, Inc., Port Isabel, Texas, \$32,200.

California Area: Walter T. Cramer, Eureka, \$47,154; Walter E. Wallin, Eureka, \$22,000; Henry R. Endly, Jr., Morro Bay, \$18,374; Trans World Marine, Inc., San Diego, \$3,000; Arthur O. Baade, San Pedro, \$4,664.

Pacific Northwest Area: Donald M. Hall, Astoria, Oreg., \$11,500; Frank Parker and Eben Parker, Jr., Astoria, Oreg., \$21,140; Paul C. Smith, Newport, Oreg., \$16,000; Frank W. Phillips, North Bend, Oreg., \$3,500; Arthur F. Todenhoft, Aberdeen, Wash., \$8,500; Hubert J. Brabant, Blaine, Wash., \$10,000; Thane B. Ohler, Blaine, Wash., \$7,000; Rodney Hurd and Ralph B. Peyton, Mountlake Terrace, Wash., \$47,163; Jack J. Childers, Port Angeles, Wash., \$15,000; Joe A. Nevaril, Port Angeles, Wash., \$9,860; Bert A. Bender, Seattle, Wash., \$5,200; Arnold O. Jangord, Seattle, Wash., \$8,667; Donald D. Knutsen, et al, Seattle, Wash., \$25,500; Oceanus, Inc. Seattle, Wash., \$20,000.

Alaska: Jerry R. Peterson and John W. Weber, Anchorage, \$28,000; Kenneth R. Lyon, Homer, \$1,500; Wayne A. Murphy and Charles H. Nims, Homer, \$68,000; Leight Sydney Wright, Hoonah, \$4,000; Harry T. Brensdal, Juneau, \$4,500; Charles R. Leshner, Juneau, \$14,000; Jack Williford, Kenai, \$10,000; George R. Hippert, Ketchikan, \$5,000; Lee G. Andrich, Kodiak, \$92,000; Howard Ulrich, Pelican, \$4,000; Robert J. Leekley, Petersburg, \$33,000; Aril T. Mathisen, Petersburg, \$9,500; Andrew J. Barlow, Jr., Wrangell, \$8,000.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the first quarter of 1966, a total of 15 applications for \$1,157,750 was received. Since the program began (July 5, 1960) 109 applications were received for \$9,722,245. Of the total, 79 applications were approved for \$5,709,076 and 18 applications for \$2,223,550 were pending as of March 31, 1966. Since the mortgage insurance program began, applications received and approved by area are:

New England Area: Received 15 (\$1,796,750), approved 10 (\$1,217,178).

California Area: Received 2 (\$1,262,000), approved 2 (\$1,262,000).

South Atlantic and Gulf Area: Received 72 (\$4,160,524), approved 56 (\$2,585,539).

Pacific Northwest Area: Received 13 (\$2,127,375), approved 7 (\$579,585).

Alaska Area: Received 7 (\$375,596), approved 4 (\$64,774).

The first applications for a Fishing Vessel Construction Differential Subsidy under the Bureau's expanded program were received in December 1964. Through March 31, 1966, a total of 66 applications for \$15,488,500 was received. Public hearings on 42 applications were completed during that period and 15 invitations to bid on a vessel were sent out.

Note: See Commercial Fisheries Review, February 1966 p. 39.

DOCUMENTATIONS ISSUED AND CANCELLED, YEAR 1965:

During 1965, a total of 663 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 503 in 1964. There were 422 documents can-

Gross Tonnage	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Great Lakes	Puerto Rico	Total
(Number)									
5-9	7	2	33	10	51	30	-	-	133
10-19	9	2	17	10	72	76	1	1	188
20-29	1	1	3	8	18	23	1	-	55
30-39	2	1	-	3	8	6	-	-	20
40-49	-	5	-	5	13	11	-	-	34
50-59	-	-	-	3	5	7	-	-	15
60-69	-	-	-	2	21	4	-	-	27
70-79	2	1	-	2	11	3	-	-	19
80-89	-	-	-	2	24	-	-	-	26
90-99	1	1	-	29	60	1	-	-	92
100-109	-	1	-	2	6	-	-	-	9
110-119	1	-	-	-	1	-	-	-	2
120-129	1	-	-	1	-	-	-	-	2
130-139	2	-	-	-	-	1	-	-	3
140-149	1	-	-	-	-	-	-	-	1
150-159	4	-	-	-	-	-	-	-	4
160-169	2	-	-	-	1	-	-	-	3
170-179	4	-	-	-	-	-	-	-	4
180-189	-	-	-	-	-	1	-	-	1
190-199	1	-	-	-	-	1	-	-	2
210-219	-	-	-	-	-	1	1	-	2
260-269	-	-	-	-	-	1	-	-	1
270-279	-	-	-	-	-	1	-	-	1
300-309	-	-	-	-	-	1	-	-	1
310-319	-	-	-	-	-	1	-	-	1
320-329	-	-	-	-	-	1	-	-	1
330-339	-	-	-	-	-	1	-	-	1
360-369	-	-	-	-	2	1	-	-	2
420-429	-	-	-	-	-	1	-	-	1
430-439	-	-	-	-	-	1	-	-	1
510-519	-	-	-	-	2	-	-	-	2
520-529	-	-	-	-	3	-	-	-	3
550-559	-	-	-	-	1	-	-	-	1
570-579	-	-	1	-	-	-	-	-	1
580-589	-	-	-	-	-	-	-	-	-
590-599	-	-	1	-	-	1	-	-	2
720-729	-	-	-	-	-	1	-	-	1
Total	38	14	56	77	299	175	3	1	663

Note: For explanation of footnotes, see table 4.

Length in Feet	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Great Lakes	Puerto Rico	Total
(Number)									
20-29	3	-	1	5	19	42	-	-	70
30-39	11	4	41	18	97	70	1	1	243
40-49	5	1	11	6	31	37	-	-	91
50-59	-	5	-	11	23	6	1	-	46
60-69	2	3	-	35	117	6	-	-	163
70-79	3	1	-	1	2	1	-	-	8
80-89	7	-	-	-	1	1	-	-	9
90-99	6	-	-	1	1	1	-	-	9
100-109	1	-	-	-	-	1	-	-	2
110-119	-	-	-	-	-	3	1	-	4
120-129	-	-	-	-	-	2	-	-	2
130-139	-	-	-	-	2	2	-	-	4
150-159	-	-	-	-	3	3	-	-	6
160-169	-	-	2	-	6	1	-	-	9
200-209	-	-	2	-	-	-	-	-	2
Total	38	14	56	77	299	175	3	1	663

Note: For explanation of footnotes, see table 4.

Table 3 - U. S. Fishing Vessels 1/--Documents Issued and Cancelled, by Areas, Year 1965 with Comparisons

Area (Home Port)	Total	
	1965	1964
Issued first documents 2/:		
New England	38	33
Middle Atlantic	14	11
Chesapeake	56	39
South Atlantic	78	50
Gulf	298	221
Pacific	175	141
Great Lakes	3	4
Hawaii	-	2
Puerto Rico	1	2
Total	663	503
Removed from documentation 3/:		
New England	33	53
Middle Atlantic	21	27
Chesapeake	32	29
South Atlantic	84	62
Gulf	131	106
Pacific	98	151
Great Lakes	20	14
Hawaii	2	-
Puerto Rico	1	-
Total	422	442

Note: For explanation of footnotes, see table 4.

Horsepower	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Great Lakes	Puerto Rico	Total
(Number)									
Under 50	-	-	2	-	1	4	-	-	7
50-99	3	1	3	4	36	20	-	-	67
100-149	7	1	16	8	56	45	-	-	133
150-199	-	7	8	13	61	48	-	-	137
200-249	4	1	10	11	52	17	-	1	96
250-299	2	-	7	3	5	13	-	-	29
300-349	4	2	1	32	68	10	-	-	117
350-399	-	-	4	3	3	3	-	-	13
400-449	8	2	-	-	1	1	1	-	13
450-499	1	-	-	2	5	4	-	-	12
500-599	5	-	1	2	1	2	1	-	12
600-699	2	-	1	-	2	3	-	-	8
700-799	2	-	-	-	-	2	1	-	5
800-899	-	-	-	-	-	2	1	-	3
1,000-1,099	-	-	1	-	1	1	-	-	3
1,300-1,399	-	-	-	-	1	1	-	-	2
1,450-1,499	-	-	-	-	1	1	-	-	2
1,500 over	-	-	2	-	6	1	-	-	9
Total	38	14	56	77	299	175	3	1	663

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
 2/There were 51 undocumented vessels in 1965 previously removed from the count. Vessels issued first documents as fishing craft were built: 438 in 1965; 33 in 1964; 8 in 1963; 5 in 1962; 3 in 1961; 4 in 1960; 31 in 1959-59; 141 prior to 1959, 30 unknown.
 3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
 Source: Monthly Supplement to Marine Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

celled for fishing vessels in 1965 as compared with 442 in 1964.



U.S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-April 2, 1966, amounted to 17,608,572 pounds (about 833,503 standard cases), according to preliminary data compiled by the Bureau of Customs, U.S. Treasury Department. That was considerably more than the 5,631,316 pounds (about 268,158 standard cases) imported during January 1-April 3, 1965.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1966 at the 12½-percent rate of duty is limited to 65,662,200 pounds (or about 3,126,771 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

In 1965, the quota was 66,059,400 pounds (or about 3,145,685 standard cases). The total imports for that year were below the quota set. (See p. 108 of this issue.)



Washington

SALMON FISHING REGULATIONS FOR 1966 IN GRAYS AND WILLAPA HARBORS PROPOSED:

Proposed regulations for commercial salmon fishing in Grays and Willapa Harbors during 1966 were discussed at a public hearing held in Olympia, Wash., April 16, 1966, by the Washington State Department of Fisheries.

The current aims of the management of coastal salmon stocks, toward which the proposed regulations were directed, include the maintenance of the present level of fishing intensity and catch-to-escapement balance on the following stocks: 4- and 5-year old Grays Harbor fall chinook; early-run Grays Harbor coho; 4- and 5-year old Willapa Bay chinook and Willapa Bay coho, the State's Fisheries Director said.

Proposals called for a reduction in fishing intensity on Grays Harbor chums to allow adequate escapement.

Increases in fishing intensity, to allow additional harvest, were proposed for 3-year-old Grays Harbor and Willapa Bay fall chinook (predominately males); early-run Grays Harbor fall chinook (Satsop-Chehalis runs); late-run Grays Harbor coho and Willapa and North River coho.

One miscellaneous regulation was proposed to make lawful for the entire year the taking and possession for commercial purposes of hard-shell clams. A statute provides that hard-shell clams may be taken commercially only from licensed clam farms; obviously a clam farmer would refrain from harvesting his clams during spawning time, so there is no need for a closed season, as is presently called for, on Puget Sound east of Dungeness Spit or in Grays or Willapa Harbors.

The regulation proposals and aims were sent fishermen and organizations concerned with the Grays and Willapa Harbors salmon fisheries and written comments were invited.

Following public comment on the proposal, regulations were to be adopted at another public hearing to be held later. (Washington State Department of Fisheries, April 1, 1966.)

SALMON FISHING REGULATIONS FOR PUGET SOUND IN 1966 ADOPTED:

Commercial salmon fishing regulations for Puget Sound for 1966 were adopted at a public hearing held in Olympia, Wash., March 29, 1966, by the Washington State Department of Fisheries. Regulations are similar to those of 1965, and are the same as those proposed at a previous hearing in Seattle with some exceptions.

Included in the changes made were: (1) A new commercial salmon fishing preserve was created in Gig Harbor; (2) The minimum size limit for commercially-caught coho salmon in Puget Sound net fisheries was changed from 22 inches to 16 inches to crop mature coho that are under 22 inches; (3) A partial opening of the Samish Bay Salmon Preserve during the fall chinook season to crop the abundant returns of hatchery-reared chinook in that area; and (4) The chum salmon fisheries will be closed from October 23 to November 30 in all areas except portions of areas

4A and 6 lying southerly of a line drawn from Liplip Point on Marrowstone Island to Double Bluff buoy on Whidbey Island and to the Point Weels flashing red range lights. This was done to protect dwindling chum runs in northern Puget Sound.

Some species were added to the foodfish list and some deleted, and regulations of the International Pacific Salmon Commission and International Halibut Commission concerning Washington catches were also adopted. (Washington State Department of Fisheries, March 29, 1966.)



Wholesale Prices

EDIBLE FISH AND SHELLFISH, APRIL 1966:

The April 1966 wholesale price index for edible fishery products (fresh, frozen, and canned) was down 0.2 percent from the previous month. April prices were somewhat mixed--lower or about unchanged for some items but higher for several products including

shrimp. At 126.5 percent of the 1957-59 average, the overall index this April was 16.3 percent higher than the same month a year earlier. With very few exceptions, prices were higher for nearly all items than in April 1965.

The subgroup index for drawn, dressed, or whole finfish was down 1.6 percent from March



Dressed halibut being stored in ice in a vessel's hold.

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, April 1966 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Apr. 1966	Mar. 1966	Apr. 1966	Mar. 1966	Feb. 1966	Apr. 1965
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					126.5	126.7	123.2	108.8
Fresh & Frozen Fishery Products:					125.0	125.3	124.9	113.3
Drawn, Dressed, or Whole Finfish:					116.6	118.5	123.7	111.0
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.12	.12	92.0	89.8	111.3	69.5
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.48	.48	140.5	140.5	139.0	119.8
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.86	.87	120.5	121.2	122.3	115.3
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.53	.71	78.3	105.9	108.2	126.9
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.85	.85	139.1	139.1	139.1	163.7
Processed, Fresh (Fish & Shellfish):					130.1	129.4	130.5	114.5
Fillets, haddock, sml., skins on, 20-lb. tins . . .	Boston	lb.	.40	.39	97.2	94.8	109.3	85.0
Shrimp, lge. (26-30 count), headless, fresh . . .	New York	lb.	1.10	1.05	128.9	123.0	123.0	117.2
Oysters, shucked, standards	Norfolk	gal.	8.13	8.50	137.0	143.3	143.3	115.9
Processed, Frozen (Fish & Shellfish):					123.0	122.8	116.0	109.5
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.43	.42	109.0	106.4	106.4	98.8
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.39	.39	112.9	114.3	117.3	108.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.32	.32	112.2	112.2	112.2	105.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.09	1.09	129.2	128.6	115.6	111.5
Canned Fishery Products:					129.6	129.6	120.7	101.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . .	Seattle	cs.	28.50	28.50	124.2	124.2	124.2	88.3
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	14.85	14.85	131.8	131.8	112.1	101.6
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.63	7.63	129.3	129.3	120.9	120.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.25	10.25	131.5	131.5	131.5	131.5

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.
Source: U. S. Department of Labor, Bureau of Labor Statistics.

to April. Prices at Chicago for Lake Superior fresh whitefish (down 26.1 percent) were sharply lower than in March when low supplies brought considerably higher prices, together with slightly lower prices for western frozen king salmon (down 0.6 percent). The lower prices were partly offset by slightly higher prices at Boston for ex-vessel large haddock. Prices remained unchanged from the previous month for western frozen dressed halibut and Great Lakes fresh yellow pike at New York City. Compared with April 1965, prices this April were higher by 5.0 percent. Prices were higher for nearly all items in the subgroup. The exceptions were lower prices for Great Lakes whitefish (down 38.3 percent) at Chicago and yellow pike (down 15.0 percent) at New York City.

The April 1966 subgroup index for processed fresh fish and shellfish rose 0.5 percent from the previous month. Prices this April were higher than in March for fresh haddock fillets (up 2.5 percent) at Boston and fresh shrimp (up 4.8 percent) at New York City, but were lower for standard shucked oysters (down 4.4 percent) at Norfolk. As compared with the same month a year earlier, the subgroup index this April was higher by 13.6 percent. Prices were considerably higher than in April 1965 for all items in the subgroup.

The processed frozen fish and shellfish subgroup index rose only slightly (up 0.2 percent) from March to April. April prices for frozen flounder fillets at Boston were higher by 2.4 percent and frozen shrimp at Chicago rose 0.5 percent from the previous month. Prices for small haddock fillets at Boston this April were lower by 1.2 percent but for ocean perch fillets they remained unchanged. The subgroup index this April was 12.3 percent higher than in the same month in 1965 because of generally higher prices--substantially higher for flounder fillets (up 16.2 percent) and frozen shrimp (up 15.9 percent).

Prices for all canned fishery products were unchanged from March to April 1966. Market conditions were steady to firm and stocks of several products were low. But compared with the same month a year earlier, the index this April was up 28.1 percent. Prices were higher than in April 1965 for canned pink salmon (up 40.7 percent), canned tuna (up 29.7 percent), and California jack mackerel (up 6.9 percent). Prices for canned Maine sardines remained unchanged for for each of the months indicated. (U. S. Department of the Interior, Bureau of Commercial Fisheries, Market News Service.)



WAYWARD DRIFT BOTTLE RETURNS AFTER 40 YEARS

A record of some sort was established recently when the Woods Hole Oceanographic Institution (Massachusetts) was notified of the recovery of a drift bottle that had been launched into the ocean nearly 40 years ago.

A drift bottle is one of the oldest and simplest means of measuring ocean currents. It consists of a corked glass bottle with a card inside. The position and date of release are recorded and the card asks the finder to report the date and location of recovery. From hundreds of returns, a picture of the surface circulation can be drawn.

Most of the bottles that are recovered turn up in a few weeks or months. Number 1456, however, was released by the U. S. Bureau of Fisheries vessel *Halcyon* on July 12, 1922, about 120 miles east of the entrance to Delaware Bay. It was found on February 20, 1962, on the beach at Oregon Inlet, N. C., some 220 miles from the release point. It was probably buried in the shifting sands for 40 years, according to a Woods Hole oceanographer. (*Sea Secrets*, Vol. 6, No. 9, October 1962.)



FOREIGN

International

FISH MEAL

WORLD PRODUCTION, 1965 AND JANUARY-FEBRUARY 1966 WITH COMPARISONS:

World fish meal production in 1965 showed a small decline from the previous year due to a drop in the anchoveta catch off South America. Peruvian output was down 17 percent and Chilean production dropped sharply. The decline was partly offset by heavy production in Norway and Iceland where fishermen landed large catches of herring in 1965. Production of fish meal was also up in Canada, South Africa, the United Kingdom, and the United States.

Country	Jan.-Feb.		Jan.-Dec.	
	1966	1965	1965	1964
.....(Metric Tons).....				
Canada	13,965	14,674	90,387	66,200
Denmark	13,291	14,816	111,189	109,687
France	2,200	2,200	13,200	13,200
German Fed. Repub.	12,912	10,178	67,555	73,900
Netherlands	1/	638	5,894	7,980
Spain	1/	4,959	2/13,247	35,407
Sweden	426	1,657	7,076	7,600
United Kingdom	15,756	15,036	80,845	74,813
United States	3,990	4,399	229,807	213,417
Angola	9,679	12,603	47,668	59,701
Iceland	12,830	9,167	172,073	127,739
Norway	32,585	24,608	309,149	185,901
Peru	421,710	316,389	1,282,011	1,552,214
So. Afr. (including S.-W. Afr.)	21,681	31,456	272,388	257,440
Belgium	750	750	4,500	4,500
Chile	60,541	23,745	70,352	144,456
Morocco	1/	1/	3/18,290	18,450
Total	622,316	487,275	2,796,631	2,952,605

1/ Data not available.

2/ Data available only for January-May 1965.

3/ Data available only for January-November 1965.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present. Japanese production of fish meal in 1964 was reported as 423,700 metric tons by the Food and Agriculture Organization.

World fish meal production in January-February 1966 was up 28 percent from the same period of the previous year due to heavy production in Peru and Chile.

Most of the principal countries producing fish meal submit data to the International Association of Fish Meal Manufacturers monthly (see table).

* * * * *

PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, 1965 AND JANUARY 1966:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

Country	1965		1964	
	Production	Exports	Production	Exports
.....(1,000 Metric Tons).....				
Angola	47.7	49.2	59.7	56.8
Chile	70.3	63.7	144.4	138.8
Iceland	172.1	146.2	125.4	124.3
Norway	309.2	268.2	185.9	179.4
Peru	1,282.0	1,260.0	1,552.2	1,416.5
South Africa (including S.-W. Africa)	272.0	224.9	257.4	226.5
Total	2,153.3	2,012.2	2,325.0	2,142.3

Country	Jan. 1966		Jan. 1965	
	Production	Exports	Production	Exports
.....(1,000 Metric Tons).....				
Angola	1/	1/	6.9	7.4
Chile	33.7	5.7	12.8	9.0
Iceland	5.5	13.9	4.2	9.6
Norway	3.4	22.7	5.9	13.2
Peru	242.4	144.8	194.1	164.9
South Africa (including S.-W. Africa)	4.2	6.7	8.7	11.3
Total	289.2	194.8	232.6	215.4

1/ Angola data not available for January 1966.

FOOD AND AGRICULTURE ORGANIZATION

WORLD TRADE IN FISHERY PRODUCTS, 1964:

Europe Leads World: Europe, excluding the Soviet Union, exported and imported more fish and fish products than any other conti-

International (Contd.):

nent in 1964, according to figures released January 27, 1966, in the Bulletin of Fishery Statistics (No. 8) of the Food and Agriculture Organization (FAO).

Table 1 - European Exports of Fishery Products by Leading Countries, 1964

Country	Quantity	Value
	1,000 Metric Tons	Million US\$
Norway	462	156
Denmark and Faroe Islands	388	118
Iceland	402	101
Netherlands	206	57
Portugal	106	49
Spain	77	35
Federal Republic of Germany	81	31
Sweden	242	26
United Kingdom	53	26
France	36	17
Yugoslavia	24	12
Poland	14	6
Ireland	10	6
Italy	2	2.5
Hungary	3	1.5
Greece	3	1.3

Note: No other European nation exported as much as \$1 million worth of fishery products.

Total European fish imports amounted to 3,784,000 tons worth US\$1,047 million; exports were 2,124,000 tons worth \$656 million. This was substantially more than Europe's international trade in fishery products in 1963. Europe that year imported 3,456,000 tons worth \$887 million and exported 1,987,000 tons worth \$584 million.

The total European 1964 fish catch was 9.66 million metric tons out of a record world total of 51.6 million tons.

Table 2 - European Imports of Fishery Products by Leading Countries, 1964

Country	Quantity	Value
	1,000 Metric Tons	Million US\$
United Kingdom	710	275
Federal Republic of Germany	795	158
France	321	123
Italy	258	93
Netherlands	299	61
Belgium and Luxembourg	189	53
Sweden	139	49
Denmark and Faroe Islands	212	33
Switzerland	62	26
Norway	95	21
Austria	59	17
Spain	69	16
Poland	82	15
Yugoslavia	54	12
Greece	32	11
Portugal	35	11
Finland	38	10
Hungary	37	7
Ireland	15	5

Note: No other European nation imported as much as \$1 million worth of fishery products.

North America Imports Record Amounts: The countries and territories of North America imported 1,131,000 tons of fish and fishery products worth US\$542 million, and exported 547,000 tons worth \$322 million in 1964. North America includes Central America, Greenland and the Caribbean Islands, as well as Canada, Mexico, and the United States of America.

In 1963, North America imported 1,048,000 tons of fishery products worth \$493 million; exported 537,000 tons worth \$292 million.

Top exporting nation among the North American group in 1964 was Canada, selling abroad 351,000 tons worth \$184 million. Canada ranked second in the world in fishery export earnings in 1964, behind Japan, which exported 573,000 tons worth \$248 million. Canada also imported 28,500 tons worth \$20.5 million.

Top importing nation in 1964 in North America and in the world was the United States, buying 975,000 tons worth \$488 million.

The U. S. ranked second in North America and ninth in the world in export earnings, selling abroad 115,200 tons worth \$56 million.

Mexico exported 41,000 tons, mostly high-quality shrimp sold to the U. S. for a total of \$51 million. Mexico ranked third in North America and 10th in the world in fishery export earnings. Mexico also imported 35,600 tons worth \$5.7 million.

Barbados exported 800 tons worth \$1.6 million and imported 1,700 tons worth \$900,000. Costa Rica exported 1,200 tons (\$1.4 million) and imported 1,300 tons (\$615,000). El Salvador exported 4,300 tons (\$4.3 million) and imported 1,800 tons (\$706,000). Greenland exported 12,700 tons (\$7.2 million) and imported 200 tons (\$99,000). Honduras exported 300 tons (\$302,000) and imported 500 tons (\$195,000).

Nicaragua exported 1,900 tons worth \$1.7 million, imported 600 tons worth \$309,000. Panama exported 7,700 tons (\$7.6 million) and imported 2,500 tons worth \$1.2 million.

St. Pierre and Miquelon exported 3,100 tons worth \$1.3 million and imported 300 tons worth \$97,000. Trinidad and Tobago exported 100 tons (\$143,000) and imported 5,300 tons (\$2.3 million).

International (Contd.):

Complete international fish-trade figures for Cuba and the other countries and territories of the region were not available.

Asian Fish Imports and Exports Rise: In 1964, the nations of Asia, excluding Mainland China, Indonesia, and a few others, exported 806,000 metric tons of fish and fish products worth US\$344 million and imported 560,000 tons worth \$193 million. In 1963, Asia exported 755,000 tons worth \$317 million and imported 479,000 tons worth \$160 million.

In 1964, the biggest fish-exporting nation in Asia and in the world was Japan, selling abroad 573,000 tons worth \$248 million. The Japanese were also Asia's biggest fishery importer, buying 187 million tons worth \$70 million.

Japan has for many years been the world's leader in fishery exports. Until three years ago, it was the leading fish catcher, but now ranks number two behind Peru.

Besides Indonesia and Mainland China, international trade figures in Asia were unavailable for Brunei, Iraq, Laos, Lebanon, North Korea, North Vietnam, Macao, and Singapore.

International fish trade figures for the rest of Asia were reported as follows:

Burma exported \$6,000 worth of fish (quantity unavailable) and imported 5,200 tons worth \$2.5 million.

Cambodia exported 1,000 tons worth \$165,000 and imported 100 tons worth \$39,000.

Ceylon exported 200 tons worth \$191,000 and imported 42,700 tons worth \$14.4 million.

China (Taiwan) exported 1,800 tons worth \$1.2 million and imported 2,000 tons worth \$1.1 million.

Cyprus had no exports but imported 2,100 tons worth \$994,000.

Hong Kong exported 13,100 tons worth \$12.3 million and imported 68,700 tons worth \$32 million.

India exported 20,600 tons worth \$14 million and imported 18,900 tons worth \$8.1 million.

Iran exported 4,600 tons worth \$4.1 million. Import figures for Iran were not available.

Israel exported \$2,000 worth of fish (quantity unavailable) and imported 19,300 tons worth \$4 million.

Jordan had no exports but imported 1,700 tons worth \$822,000.

The Republic of Korea exported 42,600 tons worth \$15 million. Korea had no fishery imports.

Malaysia, excluding Sarawak, for which figures were not available, exported 51,500 tons worth \$9.7 million and imported about 44,000 tons worth \$11 million.

Pakistan exported 43,800 tons worth \$21 million and imported 700 tons worth \$205,000.

The Ryukyu Islands exported 6,400 tons worth \$2 million and imported 11,500 tons worth \$4.4 million.

South Arabia exported 4,300 tons worth \$697,000. South Arabian import figures were not available.

Syria exported 800 tons worth \$232,000 and imported 3,700 tons worth \$1.2 million.

Thailand exported 8,400 tons worth \$4.1 million and imported 3,000 tons worth \$1.6 million.

Turkey exported 9,500 tons worth \$3.4 million and imported 200 tons worth \$74,000.

The Republic of South Vietnam exported 1,000 tons worth \$632,000. Import figures for South Vietnam were not available.

Africa Increases Fish Exports: In 1964, the countries and territories of Africa exported 618,000 metric tons of fish and fishery products worth US\$140 million and imported 209,000 tons worth \$94 million.

In 1963, Africa exported 514,000 tons worth \$118 million, and imported 214,000 tons worth \$91.5 million.

The biggest fish-exporting areas were South Africa and South-West Africa, with exports of 401,000 tons worth \$74 million in 1964. They also imported 5,200 tons worth \$4.2 million.

International (Contd.):

The next biggest exporting nation was Morocco, selling abroad 87,100 tons worth \$33.5 million, and importing 100 tons worth \$164,000.

The biggest fish importers were the Congo (Leopoldville) and Nigeria. The Congo imported 25,400 tons worth \$21 million, and Nigeria imported 41,300 tons worth \$19.3 million. The Congo exported \$4,000 worth of fish. Nigeria exported 100 tons worth \$23,000.

International fish-trade figures for other African countries were reported as follows:

Angola exported 77,000 tons worth \$10.6 million, imported 3,600 tons worth \$2.5 million. Cameroon had insignificant exports, but imported 3,300 tons worth \$2.7 million.

The Central African Republic had no exports, but imported 500 tons worth \$397,000. Chad exported 300 tons worth \$127,000 and imported 100 tons worth \$150,000. The Congo (Brazzaville) had no exports, but imported 6,300 tons worth \$2.6 million.

Dahomey exported 100 tons worth \$58,000 and imported 1,100 tons worth \$333,000. Gabon had no exports but imported 2,100 tons worth \$1 million. Gambia exported 800 tons worth \$104,000, and imported 100 tons worth \$34,000.

Kenya exported 200 tons worth \$182,000 and imported 1,800 tons worth \$717,000. Libya had insignificant exports, but imported 1,400 tons worth \$733,000.

Madagascar exported 800 tons worth \$439,000, and imported 300 tons worth \$199,000. Mali exported 2,800 tons worth \$1.2 million and imported \$31,000 worth. Mauritania exported 8,400 tons worth \$1.4 million; data on imports were not available.

Mauritius had negligible exports, but imported 3,100 tons worth \$1.3 million. Niger exported 500 tons worth \$116,000, imported \$101,000 worth.

Southern Rhodesia exported 200 tons worth \$146,000, and imported 12,000 tons worth \$3 million.

Senegal exported 6,400 tons worth \$5.2 million and imported 600 tons worth \$845,000. Sierra Leone had negligible exports, but im-

ported 6,900 tons worth \$1.4 million. Somalia exported 1,300 tons worth \$467,000 and had no imports.

Sudan exported 600 tons worth \$143,000, imported \$2,000 worth of fish. Tanzania exported 2,000 tons worth \$481,000, and imported 1,600 tons worth \$548,000.

Togo reported exports worth \$8,000 and imports of 4,800 tons worth \$1.1 million. Tunisia exported 3,600 tons worth \$2.4 million and imported 200 tons worth \$108,000. Uganda exported 300 tons worth \$163,000, and imported 100 tons worth \$96,000.

The United Arab Republic exported 2,200 tons worth \$1.8 million and imported 6,200 tons worth \$2.2 million. Zambia exported 2,800 tons worth \$498,000 and imported 5,500 tons worth \$1.2 million.

Figures for 1964 for other African countries and territories were not available.

South American Trade: The nations and territories of South America conducted international trade in fish and fish products totaling 1,777,000 metric tons worth US\$208 million in 1964, according to the Food and Agriculture Organization of the United Nations.

South America's fishery imports were 72,000 tons worth \$27 million. In 1963, the continent's international fish exports amounted to 1,351,000 tons worth \$154.5 million; imports were 67,000 tons worth \$26.5 million.

The bulk of South America's international fish trade was Peru's 1,574,700 tons of exports, and the great majority of that was fish meal and oil for feeding animals, worth \$167 million. Peru ranked third in the world, behind Japan and Canada, in fishery export earnings; it also imported 800 tons of fish worth \$573,000.

Next in the South American group came Chile, with exports of 168,000 tons worth \$22 million. Chile imported \$62,000 worth of fishery products. Complete 1964 figures for Bolivia, Paraguay, and Venezuela were not available.

International fish trade figures for the other South American countries were:

Argentina--exported 3,400 tons worth \$570,000 and imported 4,600 tons worth \$1.4 million.

International (Contd.):

Brazil--exported 1,800 tons worth \$2.8 million, imported 26,300 tons worth \$14.6 million.

British Guiana--exported 3,100 tons worth \$4.1 million, and imported 3,200 tons worth \$1.5 million.

Colombia--exported 600 tons worth \$1 million and imported 10,600 tons worth \$1.8 million.

Ecuador--exported 8,100 tons worth \$3.5 million and imported 200 tons worth \$94,000.

French Guiana--exported 100 tons worth \$89,000 and imported 200 tons worth \$176,000.

Surinam--exported 800 tons worth \$886,000 and imported 1,500 tons worth \$700,000.

Uruguay--exported 800 tons worth \$114,000 and imported 900 tons worth \$533,000. (FAO, Bulletin of Fishery Statistics, No. 8, Fishery Commodities, 1964.)

FRESH-WATER FISH

IBP TECHNICAL MEETING ON THE BIOLOGICAL BASIS OF FRESH-WATER FISH PRODUCTION:

A technical meeting on the biological basis of fresh-water fish production will be held September 1-6, 1966, at the University of Reading, Reading, England, under the sponsorship of the International Biological Programme (IBP).

The purpose of the meeting will be: (1) to review the present state of knowledge about the biological production of fish in inland waters, and to present and discuss leading ideas concerning factors influencing fish production and the flow of energy through fish in fresh-water ecosystems, (2) to identify and highlight aspects in which progress is lagging and generally to act as a starting point for IBP projects in the field of fresh-water fish production, and (3) to act as a background against which an IBP Handbook of methods for research into fresh-water fish production can be drafted.

The program of the meeting will consist of about 20 invited papers, each of which will review the present status of a limited field

from the viewpoint of production research. The authors will be chosen internationally and asked to illustrate significant points in their subject by examples drawn from their own original contributions. Considerable time will be allowed for the discussion of each paper or group of papers. There will also be discussion on methods suitable for IBP projects.

The main areas to be covered by the tentative list of papers are: (1) vital statistics of fish populations, (2) relation of fish populations to the food supply, (3) behavioral factors influencing production, (4) predation and exploitation by man, and (5) the contribution of fresh-water fish production to human nutrition and well-being.

The authors of papers and the participants in a working-party to draft an IBP Handbook will receive special invitations. All others who are interested in the meeting are invited to attend as observers, especially those who expect to participate in IBP fish research.

Additional information may be obtained from either: Dr. Shelby Gerking, Department of Zoology, Indiana University, Bloomington, Indiana 47405, or Mr. E. D. Le Cren, Fresh-water Biological Association, The River Laboratory, East Stoke, Wareham, Dorset, England.

HERRING

HERRING RESEARCH IN NORWEGIAN SEA:

Soviet Union, Norway, and Iceland have concluded an agreement for joint herring research in the Norwegian Sea during 1966. The Soviet institute participating is the Polar Institute of Fisheries and Oceanography (PINRO) of Murmansk.

GENERAL AGREEMENT ON TARIFFS AND TRADE

TWENTY-THIRD SESSION HELD IN GENEVA:

The 23rd Session of the Contracting Parties to the General Agreement on Tariffs and Trade (GATT) was held in Geneva, Switzerland, March 24-April 6, 1966.

The GATT is the principal international forum where the world's trading nations deal with trade policy problems. Its members carry on over 80 percent of world trade. It is a multilateral trade agreement which re-

International (Contd.):

placed the pre-World War II bilateral trading system. The Kennedy Round of negotiations for lowering trade barriers is also taking place within the GATT framework.

A number of agenda items for the 23rd session dealt with the continuing efforts in the GATT to reduce and remove import restrictions. These efforts have enjoyed considerable success in recent years, and the reduction of the remaining restrictions continues to be an important aspect of U. S. commercial policy.

The agenda also called for regional arrangements to receive intensive attention at the session. These include the recently announced plans for free trade areas between Australia and New Zealand and between the United Kingdom and Ireland, as well as a number of older economic integration bodies, including the European Economic Community, the European Free Trade Area, the Central American Common Market, the Latin American Free Trade Area, and the Central African Economic and Customs Union.

In recent years, the Contracting Parties to GATT have turned increasingly to trading problems of particular interest to the less-developed countries. On February 8, 1965, they signed a new part (PART IV) of the General Agreement designed to provide an institutional and legal framework for dealing with these problems. In a parallel step, GATT established a new Committee on Trade and Development (CTD) to watch over implementation of the new provisions. The Committee's first year in operation was to be reviewed during the 23rd Session, and the work of the CTD during the coming year mapped out by the Contracting Parties.

Sixty-seven countries are now full Contracting Parties to the General Agreement. In addition, a number of other countries maintain varying degrees of association with the GATT, and several others have indicated their intentions to seek full membership during the coming year. (U. S. Department of State, March 21, 1966.)

INTER-AMERICAN TROPICAL TUNA COMMISSION

ANNUAL MEETING HELD IN
GUAYAQUIL, ECUADOR:

Delegations from the five member countries of the Inter-American Tropical Tuna

Commission (IATTC): Costa Rica, Ecuador, Mexico, Panama, and the United States; and observers from Canada, Chile, Guatemala, Japan, Peru, and the Fisheries Department of the Food and Agriculture Organization of the United Nations, met in Guayaquil, Ecuador, April 19-20, 1966. The purpose was to review the status of the stocks of tuna in the eastern tropical Pacific, and to recommend fishing regulations, if necessary, to interested governments.



Annual Meeting of the IATTC, Guayaquil, Ecuador. Left to right: Senor Antonio Landa, Scientist on IATTC staff; Mr. Harold Loesch, Scientist on staff of Instituto de Pesca, Guayaquil; Dr. J. L. Kask, Director of Investigations, IATTC; Dr. W. E. Ricker, Canada, Observer; Senor Luis Pareja Pera, Director General of Fisheries, Ecuador; Senor Jose L. Cardona-Cooper, Chairman of IATTC; Dr. J. L. McHugh, U. S. Commissioner; Capt. Hector A. Chiriboga, Ecuador, Commissioner and Co-Director, Instituto de Pesca; Mr. Roy I. Jackson, Director, Dept. of Fisheries, FAO; Mr. Francois Bourgois, Director, Instituto de Pesca, Guayaquil; Senor Antonio Vaca Ruilova, Legal Adviser, Ministry of Industries and Commerce, Ecuador.

Members of the United States Delegation were Commissioners J. L. McHugh of Washington, D. C. (U. S. Department of the Interior), and John G. Driscoll, Jr., of San Diego, Calif. Advisers were W. M. Terry and D. R. Johnson of the Bureau of Commercial Fisheries, U. S. Department of the Interior; William C. Herrington, B. H. Brittin, and Richard Croker of the U. S. Department of State; and C. R. Carry and C. D. Day representing the tuna industry.

The scientific staff of the Commission, led by Dr. J. L. Kask, Director of Investigations, reported that the unregulated fishery in 1965 again overfished the yellowfin tuna resource slightly so that the present level of sustainable yield is about 85,000 short tons. The most recent estimate of the maximum sustainable yield of yellowfin is about 91,100 short tons. No estimate of the maximum sustainable yield of skipjack in the convention area has yet been possible. However, there is reason to believe that skipjack could sustain a substantially larger harvest.

To restore the yellowfin tuna resource to maximum productivity, it was necessary for the Commission to recommend a quota lower than 85,000 tons. It was agreed unanimously

International (Contd.):

to propose a quota of 79,300 tons for the 1966 yellowfin tuna fishery. This would restore the stock to maximum productivity in about three years. The best estimate of the scientists was that at the present rate of catching, this quota will be reached about the end of November 1966. When it becomes evident later in the year that the quota will be reached on or about a certain date, tuna fishing vessels will be permitted to fish only for skipjack and other tunas, and further fishing for yellowfin will be prohibited. Since it is impossible to catch skipjack without making some incidental catch of yellowfin, the yellowfin fishery will be stopped before the full quota of 79,300 tons is reached. The exact amount will depend on the length of time remaining in the fishing season. Thereafter, catches of tuna will not be allowed to contain more than 15 percent of yellowfin until the 1967 fishery opens on January 1.

Before the United States Government can impose such regulations on its own fishermen, a notice of proposed rule-making would appear in the Federal Register as a prelude to public hearings.

The staff of IATTC, in cooperation with other institutions and governments, has found that tuna in the eastern tropical Pacific are sensitive to changes in ocean currents and other variables in their environment. The circulation of the ocean, in turn, is affected by changes in atmospheric pressure and the force and direction of winds. Recent studies have shown that atmospheric conditions over one part of the world may affect oceanic circulation thousands of miles away. For example, the permanent zone of high atmospheric pressure in the vicinity of the Azores in the eastern Atlantic has an important effect on ocean conditions and tuna distribution and abundance in the eastern tropical Pacific. This emphasizes the importance of global studies of the atmosphere and the ocean if we are to understand how to harvest marine fishery resources more efficiently.

LAW OF THE SEA

CONVENTION ON FISHING AND CONSERVATION OF THE LIVING RESOURCES OF THE HIGH SEAS ENTERS INTO FORCE:

The Geneva Convention on Fishing and Conservation of the Living Resources of the High Seas entered into force March 20, 1966,

after the Netherlands became the 22nd country to ratify on February 18, 1966. The Convention is one of the four adopted at Geneva April 29, 1958, by the United Nations Conference on the Law of the Sea. The other three Conventions (the Territorial Sea and the Contiguous Zone, the High Seas, and the Continental Shelf) have entered into force.

Note: See Commercial Fisheries Review, December 1965 p. 48.

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CONFERENCE HELD AT UNIVERSITY OF RHODE ISLAND:

The first annual summer conference of the Law of the Sea Institute at the University of Rhode Island was held June 27 through July 1, 1966, at Kingston, R. I., with the help of a \$12,600 grant from the Office of Naval Research.

"The Federal Government's willingness to support this effort is just one indication of the growing concern, in both public and private circles, about serious national and international problems, dealing with the exploitation of the sea," the chairman of the University's Geography Department announced.

Progress in solving some of these problems was made at international conferences in Geneva, Switzerland, in 1958 and 1960, he said, but "there remain many areas in which continuing research and discussion are imperative. This is particularly true with respect to scientific studies pertaining to marine resource use."

The function of the Kingston conferences will be not only to clarify existing laws, but also to point up impending problems for which legal and scientific groundwork must be developed in advance.

"For instance," the chairman said, "we appear to have at least the basic scientific and technological knowledge needed to mine the sea floors, undertake shellfish farming, or similar projects, yet commercial activity is often discouraged because of the lack of clear-cut laws which give some protection for the heavy investments required."

The program was expected to draw about 150 persons for in-depth discussions of "Offshore Boundaries and Zones." Themes for conferences in 1967 and 1968 are "Extra-territorial Fishing Rights" and "The Exploitation of Minerals On and Beneath the Sea Floor."

International (Contd.):

The conference convened with a series of speeches and invited papers on the topic: "The Present Status of the Law of the Sea." On succeeding days the general topics were: "The Use of Offshore Waters," "The Continental Shelf," and "Special Problems of Offshore Control." A panel was held to discuss the Geneva conventions and the need for future modifications.

The Law of the Sea Institute, which is believed to be the first of its kind in the nation, was founded at the University of Rhode Island about a year ago to provide a forum for the exchange of ideas and information on the law of the sea. (Press release of University of Rhode Island, Kingston, R. I., March 27, 1966.)

NORTH SEA CONTINENTAL SHELF

AGREEMENT BETWEEN BRITAIN AND DENMARK:

A North Sea Continental Shelf Agreement between Britain and Denmark was signed in London, March 3, 1966, by officials of the two countries. The agreement is reported to follow the median line principal, i.e., a dividing line equidistant at all points from each country's territorial waters. The primary reason for negotiation of agreements in the North Sea is the valuable natural gas deposits believed to be in that area.

NORTHWEST PACIFIC FISHERIES COMMISSION

REPORT ON TENTH MEETING BETWEEN JAPAN AND U.S.S.R.:

Scientific Committee: The Scientific Committee of the International Northwest Pacific Fisheries Commission (Japan-Soviet) began its meetings in Moscow on March 4, 1966, and completed discussions on March 18. After devoting 18 sessions to consideration of the herring, crab, and salmon resources, the Committee presented its report to the Commission. The report was used by the Commission as a basis for setting catch quotas for crabs and salmon for the 1966 season. In brief, the Committee reached the following agreements on the condition of the stocks of fish under regulation by the Commission:

1. Herring stocks in the Sakhalin-Hokkaido areas continue in a state of decline. The Committee recommended that scientific investigations and research be continued on natural environmental factors and their effect

on the survival of the stocks, and that study be made of measures necessary for the restoration of the resource.

2. King crab stocks in the West Kamchatka area are showing evidence of decline and every precaution should be taken for their protection and conservation.

3. The level of the chum salmon run in 1966 will be close to that of 1965.

4. The size of the run of Asian red salmon in 1966 will be on the average level of the 1964 and 1965 runs.

5. King and silver salmon stocks in 1966 will be close to the average of recent years.

6. With reference to assessment of the total stocks of Asian salmon in 1966, the Committee concluded that the run will be equal to or somewhat lower than the level of the run in 1964.

Subjects Discussed: Japanese delegates agreed informally at the Japan-Soviet fisheries talks (which lasted almost six weeks) to the presence of Soviet officials at Japan's fishing bases in Hokkaido to inspect the counting of fish catches. The Moscow talks had been under way since March 1. This was the tenth meeting of the Commission under the Northwest Pacific Fisheries Convention which is due to expire in 1967. It is expected that the Treaty will be renegotiated.

Japanese and Soviet negotiators discussed at an informal session the Soviet-proposed creation of a new marine preserve in Zone A (north of the 45th parallel), curtailment of the fishing period in Zone B (south of the 45th parallel), and the problem of crab catch quotas.

According to Japanese delegation sources, the Soviets insisted last year's crab catch quotas for Japan--240,000 cases-- be cut in accordance with crab resources on the basis of a conclusion made earlier at a science subcommittee.

The Japanese side, on the other hand, called for the same number of cases as last year's level, saying the subcommittee's conclusion had no binding power on Japan for its reduction in crab catches. On the crab fishing zone, the Russians proposed to make the crab-rich area north of the 57th parallel an exclusive one for Russian fishermen, and to

International (Contd.):

eliminate the hitherto existing preserve south of the 53rd parallel to make it an exclusive fishing ground for Japan. The Japanese negotiators rejected this. They believed such a plan would put Japan at a disadvantage as compared with the Soviet Union. (The area north of the 57th parallel has heretofore been designated as a joint fishing ground for the two countries.)

Japan also rejected a Soviet plan calling for a reduction in Japanese crab catches from the present 6:4 ratio for the Soviet Union and Japan to 7:3 in the area between 56 degrees 20 minutes N. latitude and 53 degrees N. latitude.

Japan, however, agreed on a Soviet investigation into Japanese fishing operations in the northwestern Pacific after the close of the crab fishing period (April-August in past years) since the Russians alleged that Japanese trawlers and drag-netters caught a considerable quantity of crabs after crab fishing boats had completed operations and left the area.

The Soviet side at the Moscow talks proposed a reduction in the number of fishing vessels in Zone B (south of the 45th parallel), shortening of the fishing period by one month (now 87 days) in Zone A (north of the same parallel), and the creation of a new marine preserve.

Japanese fishermen engaged in salmon fishing in the northwestern Pacific made a strong plea to the Government to reject Soviet overtures at the Japan-Soviet fisheries talks. The representation was made to the Japanese Agriculture-Forestry Minister by scores of representatives of seven fisheries organizations composed of fishermen engaged in salmon fishing in the northern Pacific. The fishermen said they conducted fishing operations for a total of 100 days a year in Zones A and B--40 days in Zone A (north of the 45th parallel) and 60 days in Zone B (south of the same parallel). They expressed fear that if Japan accepted the Soviet proposal, their fishing periods would be cut to only one month, causing small-size fishing interests to go bankrupt.

Salmon and Crab Catch Quotas in Northwest Pacific: Japan and the Soviet Union completed their talks on April 14, 1966. The major outcome of the meetings was the 1966 salmon and crab catch quotas in the fishing areas under the jurisdiction of the International Northwest Pacific Fisheries Commission.

The salmon quota allotted to Japan is 96,000 metric tons; and that for the Soviet Union is



Pulling in a gill net and removing salmon from the net aboard a Japanese fishing vessel in the Northwest Pacific.

50,000 tons fished in Soviet territorial waters. (The 1965 quotas were 115,000 and 65,000 tons, respectively. In 1964, the quotas were 110,000 tons for Japan and 65,000 tons for the Soviet Union.) The 1966 king crab quotas agreed upon are 240,000 cases (48 $\frac{1}{2}$ -lb. cans) for Japan and 420,000 cases for the U.S.S.R. (In 1965, the quotas for both countries were the same. In 1964, Japan had a quota of 252,000 cases and the Soviet Union had a quota of 378,000 cases.) (Editor's Note: The Soviet pack of canned crab meat is put up in cases of 96 cans each. Hence, in some reports the Soviet quota is given as half the number of cases reported here.)

The 1966 Japanese salmon quota will permit a catch of 48,000 tons in Area A (north of 45° N. latitude) and 48,000 tons in Area B (south of 45° N. latitude).

In Area A the salmon fishing season for the Japanese mothership fleet is May 15-July 15 with a closed season July 1-July 14 in the area between 160° E. and 165° E. longitude and 48° N. and 52° N. latitude. For the land-based gill-net fleet, the season in Area A is June 21-July 25 with a closed season July 1-14 in the area between 160° E. and 165° E. longitude and 46° N. and 48° N. latitude.

In Area B, Japan's catch quota is 48,000 metric tons with a 10-percent tolerance above

International (Contd.):

the quota. The fishing season for Area B is April 30-July 30 with no prescribed closed period. The Japanese quotas represent a decrease from 1965 of 8,000 tons in Area A and 11,000 tons in Area B. In 1964, the Japanese quota in each area was 55,000 tons. The Japanese expect to license for salmon fishing 11 motherships with 369 catcher boats for Area A. This is the same number of vessels which fished in that area in both 1965 and 1964.

Japan will operate 4 motherships in the king crab fishery, the same as in 1965. The U.S.S.R. plans to operate 7 motherships for king crab, 1 less than in 1965.

Japanese Reaction to Negotiations: As in past years, there were some differences of opinion in Japanese fishing industry circles as to the outcome of the negotiations. The larger enterprises, as represented by the Greater Japan Fisheries Association, were reported to be satisfied in general with the results. This group felt that the salmon fishing regulations and quotas were the most difficult issues in the negotiations. Since the number of motherships and catcher boats which would be allowed to fish in Area A were not reduced, this group was reported to be pleased with the outcome. On the other hand, the National Federation of Salmon and Salmon-Trout Drift-Net Fishing Industry Associations, which consist of medium and small fishery enterprises, expressed strong dissatisfaction with the establishment of new restrictive waters north of 46° N. latitude, although it was instituted for 1966 only. The 332 drift-net fishing vessels (the land-based fleet) which operate in Area B (south of 45° N. latitude), usually move north beginning about June 21 and fish between 45° and 48° N. latitude. The closed season in that area, between July 1 and 14, will result in stopping these fishing operations. According to the land-based group, that area is on the route of the fish migrating to West Kamchatka and it is a good fishing ground where, at times, as many as half of the drift-net vessels congregate. (Fisheries Attache, United States Embassy, Tokyo, March 24 and April 14, 1966 and various press sources.)

Note: See *Commercial Fisheries Review*, July 1965 p. 73, June 1965 p. 43, October 1964 p. 68, July 1964 p. 42.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

FISHERIES COMMITTEE MEETING:

The Fisheries Committee of the Organization for Economic Cooperation and Development met in Paris, March 10-11, 1966. Papers were reviewed on (1) confrontation of national fishery policies, including drafts for France and the United Kingdom; (2) fisheries standards; and (3) the program of work for 1966-1967. The main work of the Fisheries Committee in 1966-1967 will be a confrontation of national fishery policies. This will include a review of the necessity for subsidies, tariffs, etc. Objective is to aid free movement of fishery products in foreign trade.

SALMON

UNITED STATES-CANADIAN PACIFIC SALMON CONFERENCE:

United States and Canadian fishery officials and industry representatives met in Ottawa, April 4-6, 1966, to give consideration to salmon fishing problems of common concern in the Pacific Northwest, British Columbia, and Southeastern Alaska. Technical consultants from the International Pacific Salmon Fisheries Commission were also present. A preliminary meeting to exchange views on these problems was held in Washington, D. C., October 12-14, 1965.

Serious consideration was given to problems arising from the intermingling in the United States and Canadian salmon fisheries in northern British Columbia and Southeastern Alaska of salmon bound for both Canadian and U. S. streams; and to the adequacy of the provisions of the 1956 Protocol to the 1930 Sockeye Salmon Convention which brought pink salmon in the Convention Area within the responsibilities of the International Pacific Salmon Fisheries Commission. Proposals to solve the problems under consideration were presented by both the United States and Canadian Delegations but no agreement was reached.

The Canadian position was that one country should not intercept salmon bound for the other. On this ground, Canada proposed some adjustment in the areas in which salmon net fishing is allowed.

International (Contd.):

The United States delegation said that the Canadian position overlooked the historic fisheries of each country which for many years had fished mixed stocks of salmon.

The Canadian Deputy Minister of Fisheries said that the rationale in support of the Canadian position is that the brunt of the effort to maintain the salmon stocks by regulation, to protect the spawning rivers from damage by other uses, and for positive measures to increase the stocks falls on the country which has the rivers in which the salmon are bred. To make these efforts worthwhile to that country it must be able to harvest the salmon and reap the benefits.

In applying this principle to the problem of mutual concern in the British Columbia-Alaska boundary area, Canada proposed the inward adjustment of salmon net-fishing limits on both sides of the border as one means of minimizing interception of salmon. The United States Delegation was not prepared to consider such a proposal and thus the Canadian Delegation stated it would be necessary to review its position with regard to the location of the salmon net-fishing limits currently in force. The Canadian spokesman pointed out that Canada would not have agreed to the establishment of the present limits had it been known in 1957 that they were to be established in Alaska on a different basis from that in British Columbia and in the United States to the south. In 1959, and again in October 1965, Canada reserved the right to move these limits seaward.

The Canadian view was that to clarify the situation it would be necessary to declare that the limits as now defined no longer exist as an agreement between the two countries. Canada could not predict how long the limits might exist in their present form as a domestic regulation. Canada suggested that a meeting be held in the near future to negotiate seaward net-fishing limits anew.

Canada recognized that other measures may be worth considering such as fishing closures at times when fish bound for the other country are caught. If this objective could be entertained by the United States, Canada was prepared to cooperate in investigations to determine what action would be effective to minimize the interception of salmon bound for the other country.

The Canadians said that in the absence of satisfactory joint action to revise net fishing limits at a meeting in the near future, it would be necessary for Canada to take a complete new look at the restrictions applied to her own fisheries with a view to possibly extending them seaward. The Canadian primary objective, however, is to minimize catching by one country of salmon bound for the rivers of the other using as a tool inward revision of the net-fishing limits.

The Canadian position with regard to problems related to the adequacy of the Pink Salmon Protocol, originally stated in Washington, was that the same principle could be applied. The Canadian view was that Canada should be getting a larger proportion of the salmon bound for the Fraser River. It was realized that there has been cooperation between Canada and the United States to build up the runs to the Fraser River, but Canada claimed that the economic cost to Canada has been several times greater than the cost of the joint effort.

The United States suggestions for the removal from division of some catches within the present Convention Area, which would have the effect of increasing the catches of Fraser River pinks by the United States, and of inward movement of the salmon net-fishing limit across Juan de Fuca Strait, which would affect Canadian more than United States fisheries, were of interest and the Canadian Delegation stated a willingness to discuss proposals of this kind on a broader basis involving the entire question of the division of catches. Canada was prepared to consider doing away with commercial fishing all the way into the Strait, but would not entertain proposals on a piecemeal basis adverse to the Canadian interest. Such proposals would have to be considered on a much broader basis involving consideration of the changing of the provisions under the Convention to give Canada a higher proportion of the catch.

The Chairman of the United States Delegation, summarized the United States position on these questions. It was that each country should fish the stocks of salmon originating in the rivers of the two respective countries, taking into account the historic fisheries of each country. The United States Delegation pointed out that the Canadian position as stated had overlooked the historic fisheries that for many years fished mixed stocks of salmon. Salmon fisheries of the two countries in the Strait of Juan de Fuca, northern Puget Sound and the extensive offshore salmon troll fishery of Canada and the United States take mixed stocks of salmon bound for United States and Canadian streams. The Canadian Johnstone Strait salmon fishery has traditionally taken mixed stocks of salmon from rivers of Canada and the State of Washington. These and other fisheries such as the United States and Canadian fisheries of northern British Columbia and southern Southeastern Alaska all operate to a greater or lesser extent on mixed stocks of salmon. The United States could not agree to action that would cause economic hardship to or erosion of these long-standing fisheries in the absence of any demonstrable conservation need of the resource—especially when such action benefits only one party at the expense of the other.

The United States made several suggestions as to how to further eliminate areas of contention between the fisheries, including a suggestion to consider a broadened international convention which would cover certain salmon problems of common concern, since the mixing of the British Columbia and United States salmon stocks is so extensive and in many areas so complete.

The United States stands ready to participate fully in programs which would have as their objective the improvement of the salmon resources of common concern.

In Southeastern Alaska and Northern British Columbia, the fishery in the national waters of each country harvests variable amounts of salmon from the rivers of the other country which migrate through these waters. The amount of intermixing is highly variable although both countries have little scientific knowledge regarding the extent of the variation. To the extent that United States national fisheries affect the achievement of a successful conservation program for Canadian stocks, it is willing to regulate its fisheries to accommodate such a goal. But in the area in question, no such need has yet been demonstrated. If Canada believes that United States fisheries are adversely affecting the conservation of salmon resources of Canadian rivers, the United States would appreciate evidence of this.

International (Contd.):

The United States has little knowledge of the effects of Canadian and United States fisheries upon the conservation programs of the stocks of salmon of northern British Columbia and Southeastern Alaska and is prepared to cooperatively study this problem and clarify the issues as they apply to these programs.

With respect to the salmon resources in the southern area, the United States believes that both countries should act whenever possible to improve the conservation programs which involve the salmon fisheries of common concern. To do less is to be unresponsive to a recent request made by the International Pacific Salmon Commission to both Governments to improve the conservation of pink salmon. The United States considers that its proposals for better management of the salmon stocks in this area are sound and consistent with good salmon management.

The present salmon convention has been an effective instrument for rehabilitating depleted runs of salmon and maintaining these runs and it has allowed United States and Canadian fisheries to operate with a minimum of friction. Nevertheless, it is believed that some administrative adjustments can be made within the terms of the present Convention to improve the conservation and management of the fisheries.

The United States emphasized that it is prepared to further explore all aspects of the fishery problems of common concern to the two countries and to fully participate in studies to determine conservation needs. On the other hand, the United States is determined to protect the important historic fisheries which operate on mixed stocks of salmon. The United States does not believe the Canadian proposal provides a practical means for resolving the common conservation and economic problems of the two industries.

One important result of the meeting was to focus attention sharply on the issues of common concern and to provide clarification of the positions of the two countries.

The second result was agreement to recommend to the two Governments a meeting between representatives of the two countries in Seattle, Wash., beginning May 17, 1966, to give consideration to determining seaward net-fishing limits anew. (Canadian Department of Fisheries, Ottawa, April 7, 1966.)

FISHING VESSELS

WORLD CONSTRUCTION DATA:

In 1964, the world's shipyards built 578 fishing and fish-processing vessels of over 100 gross tons, with a total gross tonnage of about 463,000. This was 125 percent more than in 1963, when the construction of new fishing vessels amounted to 206,000 gross tons. Japan still occupies first place with a gross tonnage of 106,000, closely followed by Sweden with 97,000, Poland 60,000, West Germany 45,000, and Spain 31,000. The United States occupies 17th place with the construction of 2 fishing vessels totaling 1,040 gross

tons. (Budownictwo Okretowe, Vol. 10, No. 8, 1965.)

Editor's Note: Data for construction of fishing vessels in 1964 by the U.S.S.R. and East Germany are not included in these totals.

In 1964, the United States added 19 vessels over 100 gross tons to the fishing fleet. Of those, 12 (3,000 gross tons) were new construction.

Table 1 - World Construction of Fishing and Fish-Processing Vessels Over 100 Gross Tons, 1964

Country	Vessels		Increase in Gross Tonnage Over 1963
	Number	Gross Tonnage	
Japan	171	106,436	26,253
Sweden	9	96,633	96,073
Poland	21	59,613	19,146
German Federal Republic	15	44,576	34,123
Spain	91	30,748	7,620
Netherlands	56	26,001	16,069
Denmark	5	23,497	18,797
Norway	52	19,843	10,427
France	43	15,438	5,622
United Kingdom	17	11,312	6,934
Canada	22	8,407	3,214
Italy	12	7,730	3,893
Chile	30	3,131	1/
Belgium	7	2,323	1,890
Portugal	1	2,162	1,702
Peru	10	1,054	1/
United States	2	1,040	-114
Yugoslavia	4	640	510
Argentina	4	560	1/
Greece	1	505	217
Total	578	462,477	256,630

1/Not available.

Note: Data do not include Soviet and East German fishing vessel construction. The data for the United States are incorrect (see "Editor's Note").

Original Source: Lloyd's Register of Shipping.

Table 2 - World Construction of Fishing and Fish-Processing Vessels of Over 100 Gross Tons by Percentage of Various Types

Type of Fishing Vessel	1964	1963	1962	1961
	(Percent)			
Fishing Vessels:	51.0	88.2	71.1	61.7
conventional	34.4	70.6	1/	1/
factory trawlers	16.6	17.6	1/	1/
Fish-processing and transporting vessels	49.0	11.8	28.9	38.3
Total (Percent)	100.0	100.0	100.0	100.0
Total (in 1,000 gross tons)	463.0	206.0	1/	1/

1/Not available.

Note: Data for the Soviet Union and East Germany are not included.

Motherships, base ships, and fish carriers contributed almost one-half (49 percent) of the total new tonnage in 1964. Factory trawlers comprised about one-third of all operational fishing vessels built.



Aden

FISHERY TRENDS IN 1965 AND OUTLOOK FOR 1966:

The Department of Fisheries, Federation of South Arabia, is making plans to substantially increase the area's fish catch which totaled 54,000 metric tons in 1964 and about 51,000 tons in 1965. The Department of Fisheries sponsored the construction of the Federal Star II, a 40-foot purse-seine vessel launched in Aden in December 1965. Two similar vessels are under construction, and two others planned. The Federal Star II is already demonstrating new fishing methods to fishermen in the area.

The sale of outboard motors in South Arabia has skyrocketed, especially in the area around Mukalla. Fishermen are also building larger vessels under the guidance of the Fisheries Department.

A proposed 3-year United Nations Special Fund Project, involving the expenditure of US\$990,000 and 4 or 5 experts to survey the fish resources in the area, is again under active consideration after having been shelved for a year.

Plans to build a \$3 million fish meal plant in Mukalla to process up to 120,000 metric tons of sardines annually are being considered jointly by United States and British interests. (United States Consul, Aden, March 25, 1966.)

Note: See Commercial Fisheries Review, February 1966 p. 50.



Angola

GOVERNMENT REGULATIONS DISCOURAGE SOUTH AFRICAN FISHING FIRMS IN ANGOLA:

Of 4 South African fishing firms which entered the Angolan fishing industry in 1964 and 1965, only 1 is known definitely to be engaged actively in fishing in Angolan waters. This is attributed to the adoption by Portugal in November 1965 of legislation requiring the use of Angolan-owned fishing vessels and Portuguese majority control of local companies. One of the South African fishing companies involved announced to its stockholders that it had completely withdrawn from the Angolan fishing industry and would probably forfeit US\$70,000 paid as a first installment on its

purchase of a fish factory in the port of Mocimedes. The South African companies had been attracted to Angola by reportedly large resources of pilchards and the absence of quota or seasonal restrictions on catches. (United States Embassy, Pretoria, April 13 1966, and United States Consulate, Luanda, January 20, 1966.)

Note: See Commercial Fisheries Review, December 1965 p. 50, March 1964 p. 40.



Australia

TUNA SEASON SHORT IN NEW SOUTH WALES:

The 1965 tuna fishing season in New South Wales was one of the shortest on record. It opened in mid-November and was over by the end of December. With some returns still due, the catch on January 1, 1966, was 2,260 metric tons, about 300 tons less than in the previous season. By early January, most of the fleet had shifted to South Australia. (Australian Fisheries Newsletter, February 1966.)



Brazil

PACKING FIRM STARTS FISHING FLEET:

A food packing company based at Belem (northeast coast), Brazil, is purchasing three trawlers from Mazatlan, Mexico. These first three vessels mark the beginning of the company's fishing fleet. The firm intends to produce shrimp and spiny lobster products for foreign markets and salt fish (bacalao) and fish meal for the domestic market. (Ocean Fisheries, vol. 2, no. 1, January 1966.)



Canada

CATCH EXPANSION FORECAST AT ATLANTIC OFFSHORE FISHING VESSEL CONFERENCE:

The first Canadian Atlantic Offshore Fishing Vessel Conference was held February 7-9, 1966, in Montreal. The vigorous campaign Canada is undertaking to increase its fish catch on the East Coast was emphasized at the Conference. Approximately 300 participants, including naval architects, fishermen,

Canada (Contd.):

fishing vessel owners, and fishery administrators, as well as others allied with the fishing industry, attended. The Conference was sponsored by the Federal-Provincial Atlantic Fisheries Committee composed of the Governments of Quebec, Nova Scotia, New Brunswick, Newfoundland, Prince Edward Island, and Canada. The purpose was to stimulate development of vessel designs particularly suited to the specific requirements of Canada's Atlantic offshore fisheries through consideration and correlation of available data relating to the design of fishing vessels over 100 gross tons with a view to developing improved concepts. Thirty-three papers were presented. The General Chairman was the Federal Deputy Minister of Fisheries of Canada, and Session Chairmen were the Deputy Ministers of Fisheries from each Province.

In the opening address, the Federal Deputy Minister of Fisheries emphasized that in recent years there has been an expansion by Canadians in the long established East Coast fisheries for various species of groundfish, including cod, haddock, flounders, and ocean perch. Present catch is about one billion pounds annually. Based on the Canadian fishing industry's plans to increase its fishing power, an increase to two billion pounds or more in the next decade is expected.

The agenda of the Conference was composed of three main items, and a summary of the points stressed under each follows:

Provincial Government Plans: The Deputy Minister of Fisheries for each of the five Provinces reviewed the present offshore fishery and future plans for his province.

QUEBEC: During the next 3 years, the Province contemplates financing the construction of 19 vessels over 100 gross tons. They will range in size from 160 gross tons (90 feet) to 500 gross tons (155 feet). It is expected that by 1975, the main increase in catch will be made up of herring--from 40 million pounds in 1965 to 175 million pounds in 1975. Ocean perch catches should increase from the present 35 million pounds to 60 million pounds by 1975, and cod from 55 million to 78 million pounds.

NOVA SCOTIA: At the end of 1964, the deep-sea fishing fleet consisted of 120 vessels. By 1968, the fleet inventory and projected catch would be as follows:

Type of Vessel	Size	Number
	Feet	
Groundfish trawlers	Over 100	90
Herring vessels	Over 100	40
Whaling	Over 100	5
Groundfish druggers	84-100	16
Long-liners	84-100	20
Scallop druggers	Over 100	50
Total		221

Table 2 - Nova Scotia Catch 1964, and Forecast 1968

Item	1964	Forecast 1968	Percentage Change
	(Thousands of Pounds)		%
Groundfish	350,251	414,000	+ 18
Herring	98,545	500,000	+400
Whale meat	1,600	5,350	+235
Swordfish	11,856	10,000	- 16
Scallops	15,979	12,000	- 25

By 1975, it is estimated no change will occur from the 1968 figures for swordfish, scallops, and whale meat; but groundfish landings should be around 560 million pounds, up from the 1968 figure of 414 million pounds, with herring doubling that of 1968, reaching 1 billion pounds.

NEW BRUNSWICK: Offshore fishing operations in this Province are still comparatively small. Plans call for an increase in these operations, but not by the construction of large single units (130-150 feet) since nearly all offshore fishing vessels are under single ownership and operation. The New Brunswick Fisheries Department has, therefore, recommended to the Fisheries Loan Board of New Brunswick that the limit in the size of trawlers to be financed for fisheries be 100 feet. The trend in New Brunswick is toward the financing and construction of many West Coast-type combination vessels of both steel and wood.

PRINCE EDWARD ISLAND: Offshore fishing in this Province did not start until 1950, when a 59-foot dragger commenced otter trawling. Vessels now range to 128 feet. No projections were made for the future. One of the main problems is finding crews for large offshore vessels. Fishermen in Prince Edward Island are concentrated in the lobster fishery which can be worked on a daily basis.

NEWFOUNDLAND: It is projected that the number of offshore trawlers operating out of Newfoundland will increase from the present 47 to 179 by 1975. The majority will consist of stern trawlers, each of about 400 gross tons. Groundfish landings are projected at 1 billion pounds by 1975, compared with 210 million pounds now. It is anticipated that the herring fleet, which consists of only four vessels, will increase considerably. The present herring fishery is based on cooperative exploration and gear research efforts by the Federal and Provincial Fisheries Departments and private industry carried out in 1964.

During the discussion which followed the Provincial presentations, no exceptions were taken to projected expansions in large vessel construction and landings. It was brought out, however, that production goals would also depend on increases in efficiency through new methods of mechanization, automation, and preservation, as well as expanded programs of fishermen's training, gear research, and exploration.

Fishing Industry Viewpoint: This session included the presentation of papers by leading members of industry. One industry representative stressed the need for greater coordination between government and the fishing industry in the future development of fisheries. He indicated emphasis should be placed on the necessity for automating fishing vessels to enable smaller crews to attain higher earnings as well as to improve handling methods and working conditions. The need for further explorations along with simultaneous development of new harvesting techniques for harvest of unutilized species was also stressed.

Canada (Contd.):

Another manager of a processing firm pointed out the importance of the United States market. He said, "the outlook for fishery products in North America is very optimistic. The demand in the United States will increase 40,000,000 pounds annually from population expansion alone Our Canadian industry is trying to take advantage of this situation and our trawler fleets have seen considerable buildup in the past few years." He also mentioned that Canada's problems are not those of marketing, but of supply and rising operating costs.

A fishing vessel owner set forth his views in a paper entitled "A Skipper's Viewpoint on Offshore Fishing Vessels." He indicated that ships without efficient antirolling and pitching systems will be idle at the dock 5 years from now because they will be unable to get crews. Also, that the crews of the future will come from Canada's high schools and fisheries colleges, supplemented perhaps by immigrants. He said naval architects, shipbuilders, and vessel owners should now think in terms of building vessels on which men of the future will want to fish. Vessel operators will have to get used to providing accommodations equal to or better than in the homes of shore workers.

Vessel Design and Equipment Trends: Twenty-two papers on a variety of topics ranging from the design of various types of vessels through economic considerations and hydrodynamic characteristics of specific Canadian-designed stern trawlers were presented during session under this agenda item. Of particular interest were several papers on the various aspects of the design of a 149-foot stern-ramp trawler suitable for the Northwest Atlantic fishery from Canadian ports. The design was the result of a cooperative undertaking between the Federal Industrial Development Service, the fishing industry, and a private naval architect.

Automation of fishing vessels was discussed in several papers. Additional papers of interest were those on combination stern trawler-purse seiners, single-deck combination vessels, trawler development in Great Britain and Germany, and construction and design of fishing vessels in Great Britain and Canada, 1955-65.

The featured speaker emphasized the need for continued activity and improvement of all vessel designs. He also indicated the great need for operational records on the actual performance of fishing vessels as a basis for future development.

—E. A. Schaefer, Chief,
Branch of Exploratory Fishing,
Bureau of Commercial Fisheries,
U. S. Department of the Interior,
Washington, D. C.

PROCESSING COMPLEX ON GASPE PENINSULA PLANNED:

The small fishing community of Riviere-au-Renard on the Gaspé Peninsula is the site of a C\$3.5 million fish-processing plant being built with financial aid from the Quebec Provincial Government. Attraction of the location is a harbor that is practically ice-free year-round. The Quebec Provincial Government also proposes to finance the construc-

tion of an ice-making plant, cold-storage, and vessel facilities at Riviere-au-Renard.

Plans for the new facilities on the Gaspé Peninsula were announced February 23, 1966, during the dedication of a new cold-storage and fish-distribution center at Quebec. The announcement was made jointly by a representative of a large fisheries cooperative federation and the Quebec Provincial Minister of Industry and Commerce.

It was also announced that the fisheries cooperative had under construction a 157-foot trawler which is sufficiently large to operate all year. The federation was also building two smaller trawlers, 87 and 60 feet long, respectively. (United States Consul, Quebec, March 3, 1966.)

FISHERY LANDINGS, 1965:

Canadian total sea fisheries landings (including Newfoundland) during 1965 amounted



Fig. 1 - Off the British Columbia coast of Canada, a purse-seiner is drawing the net tighter around a good catch of herring.

Canadian Fisheries Catch and Value of Selected Species, 1964-1965				
Species	Landings		Value	
	1965	1964	1965	1964
	.. (1,000 Lbs.) (1,000 C\$) ..	
Atlantic Coast:				
Cod	569,661	575,702	23,152	22,061
Haddock	92,721	106,313	6,041	6,224
Pollock	51,712	56,956	1,878	1,832
Flounder and sole	201,523	161,864	6,509	5,240
Herring	403,972	312,605	4,272	3,206
Swordfish	8,034	11,857	3,347	3,561
Lobsters	40,491	41,876	26,616	24,244
Scallops	19,710	16,684	10,847	7,276
Pacific Coast:				
Halibut	1/32,372	2/33,292	1/10,914	2/8,309
Herring	443,555	505,286	6,158	6,167
Salmon	86,099	124,220	24,962	30,244
1/Including 7,387,000 pounds (C\$2,482,000) landed in U. S.				
2/Including 8,168,000 pounds (C\$2,039,000) landed in U. S.				

Canada (Contd.):



Fig. 2 - The *Acadia Albatross*, a modern Canadian stern trawler. The vessel, all-welded steel strengthened for navigation in ice, is 152 feet long overall. Vessel is operated by a Nova Scotia fisheries firm.

to 2,295.6 million pounds (valued at C\$140.7 million) as compared with 2,238.8 million pounds (valued at C\$132.4 million) during 1964. (*Monthly Review of Canadian Fisheries Statistics*, December 1965.)

GOVERNMENT TO HELP FISHING INDUSTRY REPAIR NEWFOUNDLAND STORM DAMAGE:

The Canadian Federal and Newfoundland Governments have reached agreement on compensation to fishermen who suffered severe losses in the storms of January 19 and 28, 1966.

The damage reported from all sections of Newfoundland totaled C\$510,000 with a major concentration of loss in the Conception Bay-Southern Shore area, where losses reached approximately \$400,000. Losses covered a wide range of fishing vessels and equipment, although the heaviest losses involved destruction of fish-processing and other shore installations.

Compensation plans were announced by the Federal Fisheries Minister on April 7, 1966. The Canadian Federal Government will assume responsibility for assisting fishermen

in the restoration of landings and local processing facilities in settlements where these have been largely demolished. This will be done through an acceleration of the Federal Government's community program to provide suitable facilities in Newfoundland for the handling of either fresh or salted fish depending on the wishes of the fishermen concerned. It is estimated that the additional cost of such works may reach \$500,000 over the next year.

The Newfoundland Provincial Government will assume responsibility for compensation up to 60 percent of replacement value to individual fishermen in the major disaster areas for their losses of fishing vessels, engines, and cod traps.

In view of the time required to plan and design suitable community facilities, the Federal Fisheries Minister pointed out that in any community where damage was such that fishermen could not carry on the 1966 fishing operations, temporary facilities would be provided as quickly as possible. The minister also indicated that the Federal Department of Public Works would endeavor to restore public wharves and other facilities as quickly as possible and particularly in settlements where damage seriously interferes with the 1966 fishery. (Canadian Department of Fisheries, Ottawa, April 7, 1966.)

QUEBEC'S MARITIME FISHERIES, 1965:

Total Quebec landings of fishery products in 1965 amounted to about 142.4 million pounds

Species	1965		1964	
	1,000 Lbs.	C\$	1,000 Lbs.	C\$
Cod	51,265	2,019	53,536	1,887
Herring	46,065	270	40,957	290
Ocean perch	27,678	766	20,208	559
Salmon	571	361	448	259
Lobster	3,293	1,801	3,168	1,549
Halibut	449	95	428	106
Plaice	7,369	234	5,634	174
Mackerel	771	23	1,980	61
Haddock	427	21	622	30
Smelt	642	52	743	86

with a value of C\$6.3 million as compared with 131.2 million pounds, valued at C\$5.3 million in 1964 -- an increase of 8.5 percent in quantity and 18.9 percent in value. (Quebec Bureau of Statistics.)

Canada (Contd.):

PROGRAM TO IMPROVE FISH HANDLING AT SEA:

The Inspection Service of the Canadian Federal Department of Fisheries is placing emphasis on the proper handling of fish aboard fishing vessels as part of its program to bring about improved quality of fishery products. Increasing competition from other countries in traditionally Canadian markets for processed fish, together with rising living standards in the countries where those markets exist, has resulted in demands for higher-quality products.

Dockside inspection is now carried out on a voluntary basis in Canada. There have been suggestions from leaders in the fishing industry as well as from government officials that such inspection should be mandatory. This would ensure the maintenance of proper construction standards and cleanliness of fish-holding pens aboard vessels. It would also ensure that each vessel had sufficient ice aboard to chill the catch adequately.

In the meantime, the Canadian Inspection Service is cooperating with fishing skippers and crews in an educational program designed to demonstrate the best methods of handling fish at sea. (*Trade News*, Canadian Department of Fisheries, January 1966.)

PUMPS TO UNLOAD SALMON DEVELOPED IN BRITISH COLUMBIA:

The following summary of British Columbia development work on fish pumps for larger size fish was published by the Canadian Department of Fisheries in *Trade News*, December 1965:

Four fish pumps have been developed in British Columbia. Experimental work began at the Vancouver laboratory of the Fisheries Research Board of Canada in 1961 on an unloading method based on the assumption that fish could be lifted from a pressure vessel by the impelling force exerted by circulating water. Compressed air was provided to replace the fish as they left the tank and to maintain the necessary static pressure.

The small laboratory apparatus designed for these tests operated very successfully and provided the engineering data for much larger equipment installed on a salmon packer later that year.

"Derek Todd" Pump: The significant findings from the laboratory experiments were that the fish delivery pipe should be a little larger than the depth of the largest fish and that the linear velocity of the transporting water should be about 4 feet per second. The prototype pump was installed on the salmon packer *Derek Todd*, and has been used during salmon seasons for the last 5 years. It is used to rapidly unload salmon from four cylindrical pressure tanks permanently installed in the holds of the vessel where fish are held in refrigerated sea water.

Although it seems unlikely that future vessels will be equipped to discharge salmon in this way, the *Derek Todd* installation has provided much useful information which has been incorporated into the design of succeeding pumps.

The fishing company which owns the *Derek Todd* soon developed a successor to that pump. It was installed on a barge to serve as fish unloader for a fleet of fishing vessels and collectors.

Barge Pump: This pump combines a suction system for sucking up fish from the hold in a stream of water, with the pressure discharge system used on the first pump. Two pressure tanks are used alternately to provide continuous unloading, one tank being filled with fish, while the other one is emptied. The piping system employs swing check valves, and butterfly valves to reverse the flow and bypass the pump.

Most of the problems encountered in the design of the second pump and in early trials have now been overcome, and satisfactory performance has been achieved during the last two seasons. Maximum fish unloading rate is about 60 short tons of fish per hour. Salmon up to 30 pounds in weight are routinely handled and fish up to 60 pounds have been passed.

Provision for surplus water and tank storage had to be made. This was necessary to avoid pollution from harbor water, to simplify priming the system, and provide a jet of water for stirring up fish in the tanks, which is necessary for continuous unloading. This storage tank, plus the two main unloader tanks, together with the other equipment such as diesel engine, pumps, vacuum pump, etc., comprise a very heavy load for the barge.

Canada (Contd.):

In this system the fish must be introduced into a 10-inch pipe twice--the second time when leaving the tanks on the barge. Pumping rate for the circulating water is variable between 700 and 2,000 gallons per minute. Alternate cycles for loading and unloading the tanks are at two-minute intervals. The operator makes the necessary valve change manually. The single operator required for the barge pump stands on a small platform attached to the suction pipe just above the intake nozzle. From this position he can start or stop the pump, raise or lower the intake or rotate the nozzle, and direct the flow of returning water to ensure continuous fish unloading. This arrangement facilitates removal of surplus ice and flushing out of the fish hold.

Power is supplied by a 90-horsepower diesel engine and most of the components are direct driven from it.

Laboratory Design for Improved Water Suction Pump: The next pump is one developed at the Vancouver laboratory of the Fisheries Research Board of Canada. This pump was developed simultaneously with the previous one, but with the intention of rectifying or eliminating some of the less desirable features of the "barge" pump which were evident even before it was built. At the present time, the new laboratory pump has not been fully proven and further development work is needed. However, a pilot model performed very well, as did the prototype during brief trials. The pump resembles the previous one in that there are two chambers with screens for collecting fish, and check valves and butterfly valves are used to alternately direct the flow of water to certain points in the system. However, the fish-collecting chambers are much smaller in this model and the internal diameter remains 10 inches. Since each of these chambers holds only 25 fish per cycle, alternate cycles occur much more frequently--at full capacity the cycles being about 25 seconds for filling the first chamber, followed by 5 seconds for the unloading cycle. Automatic control of the system is achieved through a differential pressure controller which actuates a compressed-air operated ram to change the valve settings.

The features of this pump are: (1) It is relatively small and requires little auxiliary equipment, although it is a full-sized pump having an output of 30 tons per hour. (2) Out-

put can be regulated through the pressure controller. (3) After the fish enter the 10-inch intake, no subsequent reorientation is needed. (4) Little, if any, make-up water is required so that when unloading from refrigerated sea water carriers there is little heating of the circulating water, a very desirable feature if further storage on shore is necessary. (5) Because of its relatively small size, the pump can be mounted for raising or lowering and tidal changes need not affect it. (6) Pump motor size is 30 horsepower for a 6-inch centrifugal pump having an output of 1,500 gallons per minute against a 60-foot head.

"Air-Lift" Pump: Finally there is the "air-lift" pump which is also an experimental model developed at the Vancouver laboratory. Air-lift pumps have long been used for pumping from wells and in other applications requiring pumping from considerable depths. The equipment required is simple and inexpensive and satisfactory flow rates are achieved if the necessary submergence can be obtained.

The operation of these pumps depends on the introduction of air into a pipe below the surface of the liquid at a depth approximately twice the distance that the liquid is to be lifted above its surface. The density of the column of air and liquid in the pipe is thus reduced below that of the liquid outside and a continuous flow results. The unique feature of the air-lift system developed in Vancouver for use in elevating fish, is the creation of a "false" submergence by connecting a second vertical tube to the first with a return bend. By introducing air into the discharge leg of this U-tube at a suitable depth, a mixture of water and fish can be pumped from near the surface to a higher level. Further, by adding a syphon to the intake leg of the U-tube, fish can be pumped from the hold of a vessel onto a wharf providing the water is deep enough to obtain the necessary submergence. This depth of water can also be obtained by sinking a caisson beside the wharf.

Some advantages of the air-lift pump over other types are: (1) It is inexpensive to build, cost of the rigging being the major item. (2) The fish do not meet any restrictions after they enter the intake. They do not encounter any such devices as check valves, screens, or airlocks. Consequently the likelihood of physical damage is greatly diminished. (3) A skilled operator is not required since there

Canada (Contd.):

are no timing devices or stages. As has been pointed out, most of the other pumps utilize either airlocks or valve arrangements to transfer the fish from suction to discharge. (4) The estimated unloading rate is approximately 30 tons per hour.

Note: For additional information write to the Canadian Department of Fisheries, Director of Information and Education Service, Ottawa, Canada.

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BULK HANDLING OF HERRING MEAL TESTED IN BRITISH COLUMBIA:

Work is being carried out in British Columbia to develop suitable handling, storage, and loading devices for herring meal in bulk. Recent investigations by the Fisheries Research Board of Canada established the antioxidant BHT (Butylated Hydroxytoluene) to be effective in reducing oil oxidation and attendant "heating" in herring meal. This led to the introduction in 1965 of experimental bulk handling and shipping of BHT-treated meal by a fish meal plant. Preliminary tests using large cartons were followed by successful bulk shipments to the United States of 250 tons of meal in railway hopper cars. (Trade News, Canadian Department of Fisheries, December 1965.)



Chile

REAPPEARANCE OF ANCHOVY PREVENTS CLOSURE OF FISH MEAL PLANT:

A mass reappearance of anchovy off the Chilean coast in December 1965 came in time to prevent the closing of the fish-meal processing factory at Iquique operated by South African fishery interests. This was revealed by the Chairman of a South-West African firm with an interest in the Iquique plant. The Chairman had indicated to shareholders earlier that if no fish of any consequence were caught in December 1965, the factory would be put on a care-and-maintenance basis.

Reporting on the favorable turn of developments, the Chairman advised stockholders on February 2, 1966, as follows: "Fishing has improved considerably, and your plant has processed over 20,000 metric tons since December 8. This tonnage handled is in excess of the total amount processed during the first 11 months of last year. I must point out,

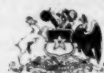
however, that it now appears that this is a seasonal fishery and we cannot expect heavy fishing during the winter months. We have now covered all our outstanding fish meal commitments and thus are in a position to take advantage of the considerably higher fish-meal prices presently appertaining on world markets." (The South African Shipping News and Fishing Industry Review, February 1966.)

* * * * *

INAUGURATION OF ANCHOVY CONSERVATION:

Following the establishment of a conservation program in Peru, the Government of Chile recently took the first official action to protect Chilean anchovy resources. Supreme Decree 118 (Ministry of Agriculture) of March 4, 1966 (Diario Oficial of March 28) prohibits the "extraction, sale, purchase, transport and possession: of anchovy less than 12 centimeters (about 4.7 inches) long; a tolerance of 20 percent is allowed in the catch.

Although this is the first official conservation measure introduced for the anchovy, the industry had previously attempted to limit the size of the fish taken through an unofficial program of voluntary restraints. The decree establishes no sanctions, and enforcement is recognized as still a major problem. (United States Embassy, Santiago, April 4, 1966.)



Colombia

JAPANESE TUNA ENTERPRISE FAILS TO MATERIALIZE:

A Japanese-Colombian joint tuna enterprise was to be established in Colombia. This information was based on an article in the Japanese periodical Suisan Kezai Shim-bun of November 25, 1965. It has since been reported that this enterprise failed to materialize.

Note: See Commercial Fisheries Review, February 1966 p. 56.



Cuba

ADDITIONS TO CUBAN FISHING FLEET:

On March 20, 1966, the first of the six cod-fishing trawlers built for the Cuban Na-

Cuba (Contd.):

tional Fishing Institute by Vigo (Spain) shipyards arrived in the Havana fishing port. Named Manjuari, the trawler is manned by 56 men, including 9 officers. The captain and chief mate of the Manjuari are Soviet citizens, the rest are Cubans. The trawler will operate primarily in the Northwest Atlantic, off Newfoundland and Labrador Peninsula.

On March 25, 1966, a 575-ton tuna fishing vessel (the Jurel) was launched for Cuba in Bilbao, Spain, shipyards, the Associated Press reported.

FISHERY LANDINGS IN 1965:

At a Cuban National Fishing Institute press conference in Havana, preliminary data on Cuban fisheries were reported. Total fishery landings in 1965 amounted to about 40,000 metric tons, about 10 percent more than the 36,300 tons in 1964. Fishing cooperatives (similar to Soviet "kolkhozes") in 1965 landed about 32,000 tons and the state-owned deep-sea fleet about 8,000 tons. Cooperatives' catch included about 9,000 tons of spiny lobsters, mostly for export.

Over 600 small vessels have been added to the Cuban fishing fleet. Cuba now has on order 20 tuna clippers and 6 cod-fishing trawlers in Spain in addition to a stepped-up program of domestic vessel construction. These additions are bound to increase Cuban high-seas landings considerably; 1966 plan for the state-owned fleet provides a catch of 17,000 tons or about 130 percent over last year's. To satisfy the need for crews, over 3,000 students are presently training in various fishery institutes, schools, and training centers; several hundred of these study in the U.S.S.R.

HAVANA FISHING PORT:

Havana's fishing port will be finished on or about July 26, 1966, to celebrate the Cuban revolutionary holiday, according to Cuban sources. Built at a cost of 30 million pesos (US\$30 million), the Havana port will accommodate 130 medium-sized (250-600 gross tons) Cuban and Soviet fishing vessels.

IMPORTS OF MOROCCAN FISH MEAL:

Morocco plans to export about 4,000 metric tons of fish meal to Cuba in 1966. Those exports were included in a trade agreement signed between Morocco and Cuba in February 1965. (United States Embassy, Rabat, February 4, 1966.)

Editor's Note: In the past, Morocco also exported to Cuba large amounts of canned sardines and small quantities of canned mackerel and canned tuna.

SERVICING OF SOVIET FISHING VESSELS:

An agreement was signed at Havana on February 4, 1966, between Cuba and the Soviet Union providing for the servicing of the Soviet fishing fleet in the newly constructed fishing port at Havana. Built with Soviet assistance, the Havana fishing port is the largest in Latin America. Its ship repair yards, floating dock, and cold-storage plant are fully operational. A communications center was being installed.

SHELLFISH EXPORTS TO FRANCE:

In January 1966, France imported from Cuba fresh and preserved crustaceans valued at 705,000 F (US\$143,000) and natural sponges valued at 123,000 F (US\$25,000). (United States Embassy, Paris, March 22, 1966.)

Editor's Note: Crustaceans exported were no doubt spiny lobsters.

**Denmark**FISHERY LANDINGS, PRICES, PROCESSING, AND FOREIGN TRADE IN 1965 AND OUTLOOK FOR 1966:

Catch: Landings of fish in local ports by Danish fishing craft during 1965 were 3 percent less than in 1964, according to preliminary data (table 1). A poor last quarter was responsible for the first annual catch decline since 1960. There was a decline in the catch of herring, industrial fish, flatfish, brisling, eel, Norway lobster, and starfish. But landings were up for cod, cod-like fish, mackerel, salmon, deep-water shrimp, and mussels. Production of pond trout set a new record.

Denmark (Contd.):

Table 1 - Danish Fishery Landings, 1964-1965

Species	1965	1964
	.. (Metric Tons) ..	
<u>Landings in Denmark by Danish Vessels:</u>		
Fiatfish ¹	58,415	74,063
Cod	77,744	65,737
Cod-like ²	74,968	58,544
Herring	344,776	360,445
Brisling	5,285	10,868
Mackerel	6,769	6,551
Eels	3,245	3,331
Salmon	1,417	1,371
Pond trout	10,976	8,460
Other fish ³	217,997	241,746
Norway lobster	1,780	2,252
Deep-water shrimp	4,990	3,280
Other shellfish	129	60
Mussels	18,248	16,388
Starfish	1,936	3,447
Total ⁴ /	828,675	856,583
<u>Landings in Denmark by foreign vessels</u>		
	203,587	200,930
<u>Grand Total</u>	1,032,262	1,057,513
Danish landings in foreign ports	3,724	4,290

1/Plaice, flounder, dab, common sole, etc.
2/Haddock, coalfish, hake, ling, etc.
3/Mostly industrial fish such as sand eel, Norway pout, etc.
4/Does not include Danish landings in foreign ports.
Source: Danish Ministry of Fisheries.

Danish landings in foreign ports were down 13 percent as a result of unloading difficulties in Great Britain. Landings by foreign fishermen (mostly Swedish) in Danish ports were slightly higher.

Prices: The ex-vessel prices paid for landed fish were generally higher during 1965. Table 2 shows monthly prices for selected species for July-December 1965 as well as the price range for July-December 1964.

Processing: Danish production of most processed fishery items was higher in 1965

than in 1964 (table 3). The overall production of fresh and frozen fillets (including blocks) was up substantially. Increased production of cod and herring fillets more than

Table 3 - Danish Production of Processed Fishery Products,
1964-1965

Product	1965	1964
	.. (Metric Tons) ..	
Canned Products:		
Herring & sprat	2, 805	2, 868
Mackerel	1, 897	2, 148
Other fish	3, 912	4, 196
Shellfish	1, 300	994
Mussels	710	633
Total canned	10, 624	10, 839
Semipreserved Products:		
Herring & sprat	5, 596	4, 800
Other fish	506	382
Mussels	748	628
Total semipreserved	6, 850	5, 810
Fresh & Frozen Fillets:		
Cod	26, 596	20, 873
Cod-like ^{1/}	3, 300	1, 415
Plaice	17, 054	18, 556
Other flatfish	2, 151	1, 236
Herring	51, 538	35, 997
Other fish	114	163
Total fresh and frozen fillets	100, 753	78, 240
Smoked Products:		
Herring & sprat	2, 067	2, 001
Mackerel	1, 783	1, 808
Eel	715	705
Salmon & trout	767	514
Other fish and shellfish	235	196
Total smoked	5, 567	5, 224
Miscellaneous Products:		
Force meat ^{2/}	1, 979	1, 708
Salted herring	159	127
Dry-salted cod	186	417
Other fishery products	1, 598	1, 279
Total miscellaneous	3, 922	3, 531
Industrial Products:		
Meal	112, 700	108, 030
Oil	39, 733	31, 801
Ensilage ^{3/}	5, 969	7, 240
Solubles	16, 822	11, 829
Total industrial	175, 224	158, 900
^{1/} Haddock, coalfish, hake, ling, etc.		
^{2/} Groundfish, milk, and flour.		
^{3/} Chemically-treated raw fish.		

Source: Danish Ministry of Fisheries.

Table 2 - Danish Ex-Vessel Average Prices During July-December 1965 and Price Range for July-December 1964

Species	1965						July-December 1964	
	July	August	September	October	November	December	High	Low
	(U. S. Cents Per Pound)						(U. S. Cents Per Pound)	
Cod, drawn	6.5	6.7	7.3	7.3	8.6	8.7	8.4	5.7
Plaice, drawn . . .	16.3	17.4	19.6	19.1	20.2	19.1	15.1	11.1
Industrial fish . .	1.6	1.8	1.9	2.0	2.1	2.0	1.5	1.2
Herring for food . .	6.5	6.3	6.2	5.5	5.6	6.3	5.1	4.1
Turbot	47.6	49.1	49.7	44.5	44.6	39.9	43.2	33.1
Salmon	92.5	85.2	86.6	87.0	110.4	123.7	131.5	101.8
Haddock	6.1	6.2	7.0	6.3	9.4	10.0	7.8	6.0
Coalfish	5.2	5.5	8.9	10.0	12.3	12.6	13.1	6.1
Common sole . . .	76.9	81.0	82.9	67.6	61.2	75.1	100.6	76.0
Eel, silver	-	64.8	58.4	-	89.8	88.0	88.4	50.2
Eel, yellow	-	48.6	46.4	-	46.2	47.7	46.0	39.9
Norway lobster . .	47.6	51.0	49.8	45.6	49.8	57.9	50.3	26.4
Lobster	145.4	137.6	130.1	104.1	89.3	93.0	136.5	84.5
<u>Shrimp:</u>								
deep-water . . .	23.9	28.4	28.2	25.5	29.9	37.8	40.3	32.7
ordinary	43.7	73.5	89.8	91.3	-	-	106.4	58.5
Dogfish	-	-	-	-	7.8	9.9	7.0	6.5

Source: Danish Ministry of Fisheries.

Source: Danish Ministry of Fisheries.

Denmark (Contd.):

offset a slight decline in that of plaice fillets. More fish meal, oil, and solubles were produced in 1965 despite a poor last quarter. The

quantity of smoked and semipreserved products increased, but that of canned fish was down slightly because of lower production of herring, sprat, mackerel, and other fish items such as tuna, trout, liver, and roe.

Table 4 - Danish^{1/} Fishery Exports by Commodity, 1965

Product	Exports in 1965			Change from 1964	
	Quantity	Value		Quantity	Value
		Kr. 1,000	US \$1,000		.. (Percent) ..
Fresh Products:					
Herring and sprat	55,369	61,246	8,881	-27	- 2
Fillets	52,480	108,520	15,735	+18	+39
Plaice	8,097	22,853	3,314	-33	-18
Cod	7,681	19,297	2,798	-20	-11
Pond trout	6,949	43,809	6,352	+23	+ 6
Eels	3,493	39,659	5,751	- 6	+ 8
Offal	17,574	7,998	1,160	+ 2	+14
Other	29,899	94,425	13,692	- 3	+14
Total fresh products	181,542	397,807	57,683	- 9	+11
Frozen Products:					
Herring and sprat	4,537	4,980	722	-28	-15
Fillets	38,629	174,481	25,300	+10	+29
Pond trout	3,793	26,940	3,906	+50	+32
Other	5,323	26,375	3,824	- 8	+35
Total frozen products	52,282	232,776	33,752	+ 5	+28
Salted Products:					
Wet-salted cod	3,604	10,268	1,489	- 6	- 1
Dry-salted cod	1,638	8,071	1,170	+41	+52
Other	964	4,487	651	+ 9	+40
Total salted products	6,206	22,826	3,310	+ 5	+21
Smoked Products:					
Salmon and trout	381	9,389	1,361	+44	+29
Other	377	2,008	291	+ 3	+ 6
Total smoked products	758	11,397	1,652	+20	+24
Canned Products:					
Fish:					
Sprat and herring	3,696	13,481	1,955	-16	-11
Mackerel	553	2,334	339	+21	+15
Other	1,444	6,293	912	+15	+18
Total canned fish	5,693	22,108	3,206	- 7	- 2
Shellfish:					
Shrimp	896	10,456	1,516	+55	+54
Mussels	923	4,113	596	+58	+61
Other	9	116	17	-50	-66
Total canned shellfish	1,828	14,685	2,129	+55	+52
Semipreserved Products:					
Fish:					
Caviar	526	7,184	1,042	+58	+57
Splake ^{2/}	171	1,614	234	+61	+47
Herring	670	1,964	285	+83	+92
Sprat, spiced	69	174	25	-80	-73
Other	534	3,238	469	+38	+50
Total semipreserved fish	1,970	14,174	2,055	+29	+49
Shellfish:					
Shrimp	205	4,498	652	+27	+49
Mussels	769	3,154	458	+10	+14
Other	2	30	4	-30	-52
Total semipreserved shellfish	976	7,682	1,114	+13	+31
Industrial Products:					
Herring meal	64,380	84,784	12,294	+14	+37
Other fish meal	4,735	5,683	824	- 4	+22
Fish solubles	24,090	12,917	1,873	+39	+47
Fish ensilage	91	55	8	-54	-38
Trout food ^{3/}	341	566	82	+349	+229
Fish oil	51,791	70,876	10,277	+71	+104
Total industrial products	145,428	174,881	25,358	+33	+59
Grand total	396,683	898,336	130,259	+ 6	+24

^{1/}Includes direct shipments from Greenland.

^{2/}Coalfish or saithe (colored to simulate salmon).

^{3/}Includes small quantity of animal food.

Note: Export data include direct landings by Danish vessels in foreign ports, which in 1965 included 2,884 tons delivered to the United Kingdom, 482 tons to Norway, 303 tons to Sweden, and 29 tons to the Netherlands.

Source: Danish Ministry of Fisheries.

Denmark (Contd.):

Exports: For the year 1965, Danish fishery products were again exported in record amounts with a 6-percent increase in quantity and a 24-percent increase in value (table 4.) The amount of fresh fish exported declined 9 percent mainly due to the continued exportation of less herring in the round and more as fillets. The value of frozen fillet exports increased 29 percent on a 10-percent gain in quantity, as increased demand resulted in higher prices for cod, plaice, and herring fillets. More smoked salmon, caviar, *sølaks* (salmon substitute), shrimp, mussels, and other higher-priced fishery products were exported--a reflection of rising European purchasing power. The average prices received for exports of fish meal, solubles, and oil were up 21 percent, 6 percent, and 19 percent, respectively, as world market prices for industrial products increased in 1965.

The European Common Market once again was the best market for Danish fishery products, accounting for 44 percent of the value of the 1965 exports (table 5). Denmark's

Table 5 - Value of Danish Fishery Exports^{1/} by Areas and Major Countries, 1965

Destination	1965		Change from 1964
	Kr. 1,000	US\$ 1,000	Percent
By Areas:			
Common Market (EEC)	362,000	52,490	+18
European Free Trade Assn. (EFTA)	325,000	47,125	+21
East Bloc	34,000	4,930	- 3
Other countries	106,000	15,370	+29
Total^{1/}	827,000	119,915	+20
By Leading Countries:			
West Germany	244,000	35,380	+24
United Kingdom	138,000	20,010	+ 5
Sweden	110,000	15,950	+39
United States	60,000	8,700	+82
Switzerland	51,000	7,395	+28
Italy	47,000	6,815	+ 7
Belgium	26,000	3,770	+24
Netherlands	23,000	3,335	+15
France	22,000	3,190	-12
Czechoslovakia	12,000	1,740	+71

^{1/}Fish oil exports not included; as a result, total does not compare with that in table 4.

Source: Danish Ministry of Fisheries.

EFTA partners accounted for 39 percent. Exports to the East Bloc countries dropped slightly. By country, West Germany was the leading buyer, followed by the United Kingdom, Sweden, and the United States. The major share of exports to West Germany consisted of fresh herring, herring fillets, and eel. Flatfish, cod, cod-like fish, and pond trout comprised the bulk of the exports to the United Kingdom. Sweden took a wide variety of

products. Herring and fish meal accounted for most of the sales to the East Bloc.



Fig. 1 - Fishing cutters at the dock in Kalundborg, one of the smaller Danish fishing ports.



Fig. 2 - Gammel Strand fish market in Copenhagen. Live eel and plaice are sold in this market. Copenhagen is a market for fishery products rather than an important fishing port.



Fig. 3 - Plaice hung out for drying--dried plaice is a specialty known all over Jutland.

Denmark (Contd.):

Exports to the United States: Danish exports to the United States in 1965 rose 80 percent in quantity and 82 percent in value (table 6). The sharp rise was due mainly to larger shipments of cod fillets and blocks. Improved landings of cod in Greenland and higher prices offered by U. S. importers contributed to the increase.

Export Outlook for 1966: The quantity of fish exported in 1966 by Denmark is expected to be about the same as in 1965 though the value of the exports may be slightly more. This forecast is based on the lack of any significant improvement in the catching power of the fleet, the continuing difficulty in recruiting fishermen, and the apparent shortage of plaice. Food fish prices should continue at current relatively high levels and possibly increase if prices of competing foods do not decline. On the other hand, in early 1966, world prices for fish meal and solubles showed some decline from the high levels of 1965.

The value of trout exports should be greater, perhaps even for a somewhat lower quantity. Trout prices have recovered from the low 1965 levels.

No Common Market action is expected this year which would adversely affect the important sale of herring products to West Germany. Prices for specialty fish products such as caviar, smoked salmon, eel, and mussels may rise during 1966 due to the high level of consumer purchasing power in Europe.

Danish processors and exporters are continuing to press for liberalization of fresh fish landings by foreign fishermen and other imports to augment supplies of domestic raw fish for processing. In March 1966, Denmark allowed the importation, thawing, boning, re-freezing and exportation to West Germany of 100 tons of cod blocks originally frozen aboard West German factory trawlers.

Imports: Danish imports of fishery products in 1965 rose 15 percent in quantity and

Table 6 - Danish Fishery Exports to the United States^{1/}, 1965

Product	Exports in 1965			Change from 1964	
	Quantity	Value		Quantity	Value
	Metric Tons	Kr. 1,000	US \$1,000	.. (Percent) ..	
Fresh & Frozen Products:					
Pond trout	699	4,115	597	+ 33	+ 6
Salmon ^{2/}	50	491	71	2/	2/
Trout eggs	1	89	13	+ 0	+ 19
Flatfish	177	1,858	270	- 25	- 12
Fillets:					
Flatfish	274	871	126	+ 23	+ 11
Cod	10,536	39,331	5,702	+115	+156
Other	690	2,474	359	+ 51	+ 54
Norway lobster	167	4,604	668	- 16	+ 17
Other	3/	2	4/	-	-
Total fresh and frozen	12,594	53,835	7,806	+ 93	+ 94
Salted Products:					
Wet-salted cod	7	30	4	- 84	- 74
Salted herring	44	148	22	+ 29	+ 90
Total salted	51	178	26	- 35	- 15
Smoked Products	2	50	7	- 11	+ 9
Canned Products:					
Sprat & herring	507	2,708	393	- 11	- 3
Mackerel	26	181	26	+ 37	+ 65
Other fish	10	78	11	- 39	- 20
Shrimp	122	1,376	200	+ 4	+ 16
Mussels	152	706	102	+158	+ 92
Total canned	817	5,049	732	+ 5	+ 11
Semipreserved Products:					
Caviar	25	302	44	+ 92	+ 83
Other fish	1	8	1	+ 0	- 37
Shrimp	7	111	16	+600	+484
Total semipreserved	33	421	61	+120	+116
Fish Solubles	600	642	93	+ 50	+ 68
Grand total	14,097	60,175	8,725	+ 80	+ 82

^{1/}Does not include exports to Puerto Rico.

^{2/}Greenland salmon; data for 1964 not available.

^{3/}Less than one metric ton.

^{4/}Less than \$500.

Note: Exports shown include direct shipments from Greenland in 1965 as follows: cod fillets 4,986 tons, flatfish fillets 257 tons, other fish fillets 681 tons, and semipreserved shrimp 4 tons.

Source: Danish Ministry of Fisheries.

Denmark (Contd.):

35 percent in value (tables 7 and 8). The principal imports were fresh herring landed directly in Danish ports by Swedish fishermen, fish oils, fish meal, fresh and frozen eel, spiced and salted herring and herring-like fish, and fish offal.

Fresh herring is imported mainly for filleting and re-export, principally to West Germany. Imports of fish meal and fish oil (principally herring oil from Iceland and anchoveta oil from Peru) are used domestically and also re-exported. Large quantities of salted herring and herring-like fish (sprat and anchovy) are imported for further proc-

Table 7 - Danish Imports of Fishery Products, 1962-1965

Products	1965			1964			1963			1962		
	Quantity Metric Tons	Value Kr. 1,000	US \$1,000	Quantity Metric Tons	Value Kr. 1,000	US \$1,000	Quantity Metric Tons	Value Kr. 1,000	US \$1,000	Quantity Metric Tons	Value Kr. 1,000	US \$1,000
Fresh or frozen:												
Fish	166,676	163,450	23,700	155,994	129,189	18,732	132,431	97,855	14,189	103,720	102,548	14,869
Shellfish	268	3,386	491	450	3,591	521	574	3,584	520	398	2,857	414
Salted or smoked:												
Spiced & salted herring, etc. 1/	4,103	9,166	1,329	4,265	8,397	1,218	4,429	8,633	1,252	3,735	7,196	1,044
Wet- and dry- salted cod	2,180	7,713	1,119	1,170	4,614	669	3,400	3,400	493	499	1,212	176
Other 2/	473	4,277	620	223	971	141	113	318	46	126	337	49
Canned and semipreserved:												
Fish	1,269	7,590	1,101	1,306	8,310	1,205	1,194	5,582	809	1,101	5,435	788
Shellfish	715	9,610	1,393	731	9,518	1,380	383	6,127	888	285	4,075	591
Industrial products:												
Fish meal	20,835	28,220	4,092	18,626	20,835	3,021	12,309	11,914	1,728	15,520	16,616	2,410
Herring oil	28,885	41,722	6,050	11,521	15,304	2,219	2,545	2,399	348	11,861	1,505	218
Medicinal oil	2,281	4,271	619	2,570	4,724	685	2,557	3,837	556	2,439	3,218	467
Other marine oil	13,890	20,260	2,938	14,089	18,072	2,620	19,032	12,211	1,771	17,738	14,215	2,061
Fish offal	41,735	17,292	2,507	23,920	9,648	1,399	16,448	6,349	921	11,476	4,083	592
Other fishery products . .	34,739	16,741	2,427	40,902	16,661	2,416	9,349	4,755	689	4,656	3,578	519
Total imports	318,049	333,698	48,386	275,767	249,834	36,226	202,576	166,964	24,210	163,554	166,880	24,198

1/Herring, sprat, & anchovy--does not include items classified as semipreserved.

2/Mainly smoked but also other types of preparation; mostly fish roe.

Note: Products originating in Greenland or the Faroe Islands are not included.

Source: Danish Statistical Department.

Table 8 - Danish Imports of Fishery Products, by Commodity and Country, 1965

Product	Iceland	Norway	Sweden	Nether- lands	United Kingdom	West Germany	United States	Other Countries	Total 1965		
									Quantity Metric Tons	Value Kr. 1,000	US \$1,000
Fresh or frozen:											
Fish	1,125	2,015	159,332	1,724	342	977	38	1,123	166,676	163,450	23,700
Shellfish	1	118	75	29	3	2	14	26	268	3,386	491
Salted or smoked:											
Spiced & salted herring, etc. 1/	2,771	461	495	321	35	-	-	20	4,103	9,166	1,329
Wet- and dry-salted cod	276	1,306	-	2	-	-	-	596	2,180	7,713	1,119
Other 2/	371	57	6	-	2	-	-	37	473	4,277	620
Canned and semipreserved:											
Fish	4	97	84	1	12	2	63	1,006	1,269	7,590	1,101
Shellfish	37	120	8	-	-	-	310	240	715	9,610	1,393
Industrial products:											
Fish meal	11,102	9,732	1	-	-	-	-	-	20,835	28,220	4,092
Herring oil	24,996	51	-	-	-	3,838	-	-	28,885	41,722	6,050
Medicinal oil	681	1,179	-	-	53	346	-	22	2,281	4,271	619
Other marine oil	83	583	19	-	2	19	-	3/13,184	13,890	20,260	2,938
Fish offal	497	710	473	5,860	455	32,537	-	1,203	41,735	17,292	2,507
Other fishery products . .	-	1,267	4/26,202	2,166	712	3,819	181	392	34,739	16,741	2,427
Total 1965	41,944	17,696	186,695	10,103	1,616	41,540	606	17,849	318,049	333,698	48,386
Total 1964 5/	28,115	11,651	184,211	3,032	1,137	28,753	2,519	16,360	275,778	249,419	36,166

1/Herring, sprat, and anchovy--does not include items classified as semipreserved.

2/Mainly smoked but also other types of preparation; mostly fish roe.

3/Includes 13,033 metric tons of refined fish oil from Peru valued at Kr. 18.7 million (\$2.7 million).

4/Primarily fish for reduction.

5/Slight discrepancy from 1964 data shown in Table 7.

Note: Products originating in Greenland or the Faroe Islands are not included.

Source: Danish Statistical Department.

Denmark (Contd.):

essing into semipreserved specialties consumed in Denmark. Fish offal, primarily selected cod waste, is imported by Denmark's important mink-raising industry.

Imports from the United States: The quantity and value of fishery products imported from the United States in 1965 fell 82 percent and 31 percent, respectively (table 9). In 1965, there were no imports of menhaden oil, which in previous years accounted for the major share of all imports from the United States.

King crab, shrimp, and salmon accounted for most of the imports from the United States



Fig. 4 - Tuna fishery in Oresund. Bluefin tuna landings in Denmark vary considerably from year to year. Most of the catch is made in the North Sea.

in 1965. All the king crab and much of the shrimp and salmon were of Alaskan origin. Among other U. S. fishery products from which a market might be developed in Denmark (and other European countries) are Maine lobsters, eel, scallops, and oysters.

Import Outlook for 1966: The Danish Ministry of Commerce issued a decree on December 21, 1965, liberalizing the importation



Fig. 5 - Danish fisherman standing on a typical live box or float in which live plaice are held for marketing in Fredrikshavn.

Table 9 - Danish Imports of Fishery Products From the United States, 1964-1965

Products	1965			1964		
	Quantity	Value		Quantity	Value	
	Metric Tons	Kr. 1,000	US\$1,000	Metric Tons	Kr. 1,000	US\$1,000
Fresh or frozen:						
Salmon, fresh or chilled	14.9	130.3	18.9	0.5	9.1	1.3
Salmon, frozen	23.3	245.7	35.6	38.6	415.7	60.3
Shrimp	14.2	215.5	31.2	0.1	2.4	0.3
Other fresh and frozen	0.1	2.6	0.4	0.6	10.2	1.5
Salted or smoked	-	-	-	0.8	10.2	1.5
Canned:						
Salmon	57.5	430.8	62.5	27.7	172.5	25.0
Tuna	2.6	17.4	2.5	3.1	20.5	3.0
Shrimp	157.8	1,398.3	202.8	91.6	818.6	118.7
Crab	138.2	2,189.0	317.4	159.4	2,412.3	349.8
Other canned fishery products	2.6	34.7	5.0	10.1	112.4	16.3
Semipreserved:						
Fish	0.6	6.1	0.9	1.0	10.6	1.5
Shellfish	13.3	214.0	31.0	12.6	204.2	29.6
Industrial:						
Fish oil	-	-	-	2,072.4	2,871.2	416.3
Fish meal	0.3	1.0	0.1	-	-	-
Other	0.1	10.7	1.5	0.3	5.0	0.7
Total	425.5	4,896.1	709.8	2,418.8	7,074.9	1,025.8

Note: Does not include agar-agar or seaweed.

Source: Danish Statistical Department.

Denmark (Contd.):

of most of the remaining fresh and frozen fish and shellfish still restricted. A rise in the amount of food fish imported should result. Landings of fresh herring in Danish ports by Swedish fishermen, which account for a major share of the imports, were down in the first 2 months of 1966 as a result of bad weather. If the shortage of plaice landed by Danish vessels continues, more imports of plaice from the Netherlands will be needed to help processors meet export orders. If supplies of raw fish, especially cod, shrimp, and flatfish, landed by Danish fishermen are inadequate to meet processors needs, direct landings by foreign fishermen (as presently permitted in the case of Swedish herring) may be approved by the Danish Fisheries Ministry which has been favoring a more liberal attitude to such imports. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 23, March 24, and April 6, 1966.)

FISH MEAL, OIL, AND SOLUBLES PRODUCTION AND EXPORTS, FEBRUARY 1966:

In February 1966, Denmark produced 6,902 metric tons of fish meal, 8,826 tons of fish oil,

Danish Exports of Industrial Fishery Products, February 1966		
Country of Destination	Fish Meal ^{1/}	Solubles
	... (Metric Tons) ...	
Netherlands	-	85
Austria	20	-
United Kingdom	1,445	-
West Germany	140	1,783
Italy	40	-
Switzerland	300	-
Sweden	351	-
Poland	800	-
Czechoslovakia	300	-
Total	3,396	1,868

^{1/} Mostly herring meal.

Note: Danish exports of fish oil in January 1966 totaled 5,317 tons; fish oil export data for February 1966 not available.

and 257 tons of fish solubles. (Regional Fisheries Attache, U. S. Embassy, Copenhagen, April 4, 1966.)

SMALL FISH MEAL PLANT FOR RESEARCH USE DEVELOPED:

A small fish-reduction plant--designed and built for research use with a capacity of 55 pounds of chopped fish per hour--is being marketed by a Danish research company.

The plant combines cooker, press, and dryer in one unit mounted on a wheeled frame for mobility. According to the company, the fish are processed exactly as in a large commercial plant so that realistic experimentation in cooking, pressing, and drying may be carried out on a small scale.

Main specifications of the plant are: cooker--indirect steam in jacket and rotor as well as direct steam, variable-speed drive; press--single screw, 1 to 4 ratio, variable-speed drive; and dryer--steam jacketed with steam-heated rotor, variable-speed filling.

The dimensions are 75 inches long by 31½ inches wide by 63 inches high. The price of the unit is US\$12,000 f.o.b. Esbjerg, Denmark. (Regional Fisheries Attache, U. S. Embassy, Copenhagen, March 14, 1966.)

SEALSKINS FROM GREENLAND AUCTIONED:

The Royal Greenland Trade Department held another of its regular auctions for Greenland sealskins on February 23, 1966, in Copenhagen, Denmark. Demand was good and prices were up.

The entire offering of about 28,100 sealskins (mostly ringed skins) was sold for a total of about US\$488,650. Prices were considerably above the prices for skins of comparable quality sold at the September 1965 auction. Ringed sealskin prices increased about 20 percent, harp 3 percent, bladder-nosed 10 percent, and saddle 18 percent. The best quality skins increased the most with some poorer quality skins declining in price. A few of the latter sold for only 30 cents a skin while numerous top-quality lots brought \$53.60 a skin. No sealskins from Alaska or Canada were offered.

All important foreign buyers were present. Representatives of large West German companies bought most of the coat skins, but the auction was well supported also by buyers from the French shoe manufacturing industry.

The next sale of Greenland sealskins by the Royal Greenland Trade Department is expected to be held September 14, 1966, preceded by a week of inspection of offerings.

January 1966 Greenland seal catches landed in Umanak were reported to be the best in

Denmark (Contd.):

25 years and said to be a sign that it is becoming colder in Greenland. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 3, 1966.)

Note: See Commercial Fisheries Review, December 1965 p. 53.



Ecuador

LAW ON FOREIGN FISH LANDINGS:

According to the legal advisor of the Ecuadoran Navy, the matter of landing fish from foreign vessels falls within Article 874 of the Ecuadoran Commercial Code which considers the landing of merchandise in general. Such a landing is permitted only when it is judged to be a "forced landing" for the following causes: (a) If the owners of the merchandise require that it be landed in order to prevent its damage or spoilage; (b) if the landing is absolutely necessary in order to repair the vessel; and (c) if it is recognized that the cargo has been damaged.

In addition, the landing of fish by Ecuadoran vessels in any foreign port must be made through previous conformance with the Ecuadoran export law. (United States Embassy, Quito, April 11, 1966.)



East Germany

FISHING VESSELS SOLD TO DANISH AND SWEDISH FIRMS:

An East German shipyard at Rosslau on the Elbe River has contracted to deliver 8 small fishing vessels to Swedish firms during 1966, according to the Swedish press. The East German shipbuilder is also reported to have contracted to deliver 20 to 25 small stern trawlers to Danish firms. (Various sources.)



Greece

FISHERY LANDINGS AND TRENDS, 1965:

Greek fishery landings in 1965 were estimated at about 106,000 metric tons with an ex-vessel value of US\$41.6 million. That was

a gain of 1.4 percent in quantity and 19.6 percent in value over the previous year.

Landings from the Atlantic in 1965 totaled 27,073 tons (up 29 percent) with an ex-vessel value of \$10.5 million. The increase reflected the buildup of the Greek freezer-trawler fleet from 27 to 32 vessels during 1965.

The 1965 landings also included a Greek coastal catch of about 67,000 tons (same as in 1964), a Mediterranean catch of 4,000 tons (down 88 percent), and an inland catch of 8,500 tons (down 12 percent). United States Embassy, Athens, March 8, 1966.)

FROZEN FISH IMPORTS BANNED:

The issuance of import permits for frozen fish was suspended by the Greek Ministry of Commerce as of March 17, 1966, until further notice. The measure is intended to allow the sale of large stocks of frozen fish, estimated at 12,000 metric tons, brought in by Greek deep-sea trawlers. The measure primarily affects Japanese fish imports into Greece. Sale prices for the various kinds of fish were pegged at the maximum prices on March 4, 1966. (United States Embassy, Athens, March 25, 1966.)



Guinea

FISHERY AID BY SOVIETS:

Soviet aid to Guinean fisheries was promised in an Agreement on Cooperation in Marine Fisheries, signed in Conakry in February 1966. Under the Agreement, the U.S.S.R. will: (1) Supply Guinea 10 fishing vessels and provide technical experts for 3 years to train Guineans how to use and repair them; (2) Accept 60 Guinean students and apprentice fishermen to train in Soviet fishery schools and universities. (Tass, February 2, 1966.)



Iceland

EXPORT STOCKS OF PRINCIPAL FISHERY PRODUCTS, FEBRUARY 28, 1966:

As of February 28, 1966, Iceland's stocks of frozen groundfish (fillets) for export to the United States totaled 1,662 metric tons, a gain

Iceland (Contd.):

Icelandic Export Stocks ^{1/} of Principal Fishery Products, February 28, 1966			
Item	Quantity		Value
	Metric Tons	Million Kz.	US\$ 1,000
Groundfish, frozen:			
for export to:			
U.S.	1,662	43.2	1,003.2
other countries	2,518	46.7	1,084.5
Stockfish	500	16.5	383.2
Herring, frozen	2,030	12.8	297.2
Industrial products:			
fish meal:			
herring	16,418	137.9	3,202.5
other fish	7,802	56.3	1,307.5
herring oil	17,665	143.1	3,323.3

^{1/}Includes only stocks intended for export.

Note: Icelandic kronur 43.06 equal US\$1.00.

of 107 tons from the stocks on hand January 31, 1966. (United States Embassy, Reykjavik, April 5, 1966.)

EXPORTS OF FISHERY PRODUCTS, 1964-65:

During 1965, there was a considerable increase in Iceland's exports of herring oil, herring meal, and iced fish (including herring) as compared with 1964, according to the Ice-

Icelandic Fishery Exports, 1964-65					
Product	Qty.	1965		1964	
		Value f.o.b.		Value f.o.b.	
		Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
Salted fish, dried	2,554	51,888	1,205	1,138	28,154
Salted fish, uncured	25,990	439,841	10,217	23,955	371,321
Salted fish fillets	1,882	33,199	771	1,428	21,839
Wings, salted	1,486	20,109	467	1,173	14,765
Stockfish	12,243	375,944	8,731	11,580	337,403
Herring on ice	11,553	8,014	188	392	1,104
Other fish on ice	56,520	187,859	4,384	34,512	215,039
Herring, frozen	25,821	164,033	3,808	21,891	129,918
Other froz. fish, whole	7,554	96,649	2,244	4,814	53,050
Frozen fish fillets	49,125	1,148,033	26,661	54,095	1,006,264
Shrimp & lobster, froz.	1,002	129,810	3,015	1,171	109,926
Roes, frozen	2,255	34,602	804	1,703	27,900
Canned fish	882	32,537	758	381	20,967
Cod-liver oil	6,399	68,248	1,585	9,815	91,717
Lumpfish roes, salted	887	45,814	1,064	419	10,600
Other roes for food, salted	2,033	33,530	779	2,971	43,939
Roes for bait, salted	1,588	14,627	340	3,049	25,280
Herring, salted	39,027	491,054	11,404	46,223	517,085
Herring oil	82,172	677,627	15,737	52,403	417,619
Ocean perch oil	-	-	-	28	188
Whale oil	3,066	28,184	654	4,499	37,582
Fish meal	19,532	133,432	3,089	26,738	166,368
Herring meal	124,371	943,362	21,808	96,379	594,803
Ocean perch meal	3,358	24,201	562	2,265	13,239
Wastes of fish, froz.	9,148	34,046	791	7,165	22,967
Liver meal	607	4,311	100	575	3,827
Lobster & shrimp meal	50	231	5	156	686
Whale meal	1,363	8,593	200	1,387	7,698
Whale meal, frozen	2,660	23,878	554	2,277	18,167

Note: Values converted at rate of 1 krona equals 2.32 U. S. cents.

landic Statistical Bulletin, February 1966. Exports of frozen fish fillets, cod-liver oil, and salted herring showed a decline in 1965.

FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-OCTOBER 1965:

Species	Jan.-Oct.	
	1965	1964
... (Metric Tons) ...		
Cod	229,799	270,469
Haddock	46,290	48,992
Saithe	23,311	20,216
Ling	4,539	4,302
Wolfish (catfish)	7,482	8,159
Cusk	1,673	2,962
Ocean perch	27,677	25,174
Halibut	850	1,019
Herring	558,392	501,350
Capelin	49,612	8,640
Shrimp	632	348
Other	15,168	12,453
Total	965,425	904,084

Note: Except for herring which are landed round, all fish are drawn weight.

UTILIZATION OF FISHERY LANDINGS, JANUARY-OCTOBER 1965:

How Utilized	Jan.-Oct.	
	1965	1964
... (Metric Tons) ...		
Herring and Capelin^{1/} for:		
Oil and meal	531,338	436,003
Freezing	18,836	20,570
Salting	57,328	53,199
Groundfish^{2/} for:		
Fresh on ice	29,272	31,671
Freezing and filleting	172,417	173,935
Salting	84,325	87,768
Stockfish (dried unsalted)	52,188	82,067
Canning	533	242
Oil and meal	2,760	3,455
Crustaceans for:		
Freezing	3,547	2,816
Canning	204	159
Home consumption	12,677	12,199
Total production	965,425	904,084

^{1/}Whole fish.^{2/}Drawn fish.

Source: Icelandic Statistical Bulletin, February 1966.

TRADE AGREEMENTS WITH EAST EUROPEAN COMMUNIST COUNTRIES:

U.S.S.R.: An Icelandic-Soviet trade agreement for 1966-1968 was signed in Moscow in mid-November 1965. The new agreement is of similar scope to previous Soviet-Icelandic trade protocols. Under the 1966-1968 agreement, the Soviet Union will purchase from Iceland annual quotas of 12,000-15,000 metric tons of frozen fish fillets, 5,000 tons of bulk frozen fish, 5,000 tons of frozen herring, 10,000-15,000 tons of salted herring, canned goods to a value of between 24 million and 33½ million kronur (US\$557,000-778,000), and various nonfish-

Iceland (Contd.):

ery items. In return Iceland will buy gasoline, fuel oil, machinery, vehicles, timber, iron, and steel.

Poland: A new trade agreement between Poland and Iceland was signed in November 1965 for 1 year providing for Polish exports of iron and steel (including slipways), timber, coal, textiles, and chemicals in return for Icelandic exports of salted herring, frozen fish, fish meal and oil, sheepskins, and other goods.

Czechoslovakia: After an official visit to Czechoslovakia in late 1965, the Icelandic Minister of Commerce expressed the hope that the next trade agreement between the two countries would be on a freer basis. The Director of the Czech trading organization Centrotex said during an October 1965 visit to Iceland that he hoped that trade with Iceland might be increased and that it would be possible to hold a Czech trade exhibition in Reykjavik in 1966. No doubt included in such an agreement would be exports of fishery products by Iceland. (*Icelandic Review*, vol. 3, no. 4, 1965.)

**India****EXPANSION OF SHRIMP EXPORTS TO THE UNITED STATES:**

India's shrimp exports to the United States may be expanded by a new contract with a New York City firm. Plans of that U. S. firm to contract with Kerala State, India, for the delivery of one million pounds of fishery products annually were announced in February 1966. A representative of the U. S. firm mentioned the need to modernize fish-processing methods in India to increase export earnings. The same theme was recently stated by an Indian shrimp packer in the article "Reorientation of Packaging Pattern for the U. S. Market," which appeared in the first issue (January 1966) of the *Seafood Trade Journal*, Cochin, India.

FISHING CHART OF INDIA'S WEST COAST TO BE PUBLISHED BY NORWAY:

A fishing chart of the west coast off India is to be published by the Norwegian Agency for International Development for the use of India's growing fishing fleet.

The chart is being prepared by a Norwegian fisheries expert who spent four years with the Indo-Norwegian Project to develop the fishing industry along the south coast off India.

Of the 16 grounds to be shown on the chart, several were previously unknown. In particular, a rich belt of lobsters and shrimp at a depth of 1,800 feet will be indicated. The Norwegian Agency for International Development will distribute the chart free of charge to fisheries departments in Indian States who, in turn, will make them available to Indian fishing skippers.

The Indo-Norwegian Project, started in 1953, has set up six fishing stations in the States of Kerala, Mysore, and Madras with boat-building yards, ice factories, freezing plants, and insulated transport vans. (*Fishing News International*, February 1966.)

FRESH-WATER FISHERIES DEVELOPMENT:

Under a special Indian Government development program, 43 fisheries projects, covering 9 states and costing US\$4.9 million have been undertaken. The program is designed to increase production through surveys, introduction of fish-culture techniques, investigation of fish breeding, and development of reservoir fisheries. (Editor's Note: India's fresh-water fisheries catch amounted to 459,900 metric tons in 1964, according to the Food and Agriculture Organization.)

On March 17, 1966, the Government of Uttar Pradesh, an inland state in northern India, announced the establishment of a state-owned Fisheries Corporation with an authorized capital of \$1.2 million to develop the State's inland fisheries resources. (United States Embassy, New Delhi, April 7, 1966.)

**Ireland****FISHERIES EXPANSION IN 1965:**

Irish fish consumption increased 11 percent in 1964 and 13 percent in 1965. Intensified promotion and better distribution were the main reasons for the gain. In early 1966, Dublin fish merchants reported that the relaxation of Catholic Lenten fast had caused no loss of business.

Ireland (Contd.):

Irish landings of finfish in 1965 amounted to 63.0 million pounds with an ex-vessel value of £1.3 million (US\$3.6 million) as compared with 54.6 million pounds valued at £1.1 million (\$3.0 million) in 1964. Irish shellfish landings were valued at slightly over £400,000 (\$1.1 million) in both 1964 and 1965.

The increased landings in 1965 can be attributed to the efforts of the Irish Sea Fisheries Board to encourage deep-sea fishing, mainly through financial assistance to fishermen purchasing vessels. The demand for fishing craft in Ireland is said to be unprecedented and some 100 applications for vessels were before the Board for consideration in early 1966. (United States Embassy, Dublin, February 25, 1966.)



Ivory Coast

DEVELOPMENTS IN TUNA FISHERIES:

There are two recent developments of interest in the tuna fisheries of the Ivory Coast.

Although the invitation to bid for the proposed 3,000-ton capacity freezing plant was withdrawn in the summer of 1965, a new proposal was then issued for a freezer of the same capacity plus a tuna-canning plant having a capacity of 50 metric tons of raw fish per day, both plants being incorporated in one project. The new bids had been received (2 from U. S. companies and 2 from French firms), and announcement of the bid award was expected. It is expected that this cannery is to be constructed to the most modern and efficient plans, and that the canned tuna to be produced will be competitive on the world market both as to quality and price.

The Abidjan laboratory of ORSTOM (Office de la Recherche Scientifique et Technique Outre-Mer) is acting as the center for a program of tuna research (for the present devoted mostly to fishing effort and catch statistics) participated in by the ORSTOM laboratories in Dakar and Pointe Noire. While the Pointe Noire program is now in its third year, Dakar commenced its work in November 1965 and Abidjan started its program on January 1, 1966. Future work in tuna research will depend largely on ORSTOM staffing during the next several years. (Fish-

eries Attache, United States Embassy, Abidjan, February 3, 1966.)



Japan

TUNA PRICES DECLINE:

Beginning in late March 1966, frozen tuna export and ex-vessel prices began to decline. The f.o.b. price of frozen round albacore, which reached a high of about US\$535 per short ton around March 24, had subsequently declined by as much as \$20 a ton for vessel-frozen products. The ex-vessel price dropped from 200 yen (\$504 a short ton) to about 185 yen a kilogram (\$467 a short ton). Buy offers (albacore, round, f.o.b. \$525-530; yellowfin, gilled & gutted, f.o.b. \$510-515) from U. S. packers located at Puerto Rico slackened, and prices declined by \$5-10 a ton.

The quality of skipjack caught off Japan was found to be too soft to make a first-rate pack and U. S. packers stopped buying that species after having contracted to purchase about 4,500 short tons. This development, in turn, caused the ex-vessel price of skipjack at Makurazaki, southern Kyushu, to drop to 85 yen a kilogram (\$214 a short ton), from 120 yen a kilogram (US\$302 a short ton). At Yaizu in late March, the ex-vessel price declined by 15-18 yen a kilogram (\$38-45 a short ton), to 103-105 yen a kilogram (US\$260-264 a short ton). (Suisan Tsushin, March 29 and April 1, 1966.)

* * * * *

EXPORT QUOTAS FOR FROZEN TUNA, 1966/67:

The Board of Directors of the Japan Frozen Tuna Exporters Association at a meeting on March 4, 1966, adopted the quotas on exports of frozen tuna for the fiscal year 1966 (April 1, 1966, through March 31, 1967).

1. Exports to the United States and Canada from Japan proper--110,000 short tons.
2. Exports to other countries--70,000 metric tons.
3. Tuna loins for export to the United States--9,000 short tons.
4. Exports to overseas bases--48,000 metric tons. (These "exports" are the frozen fish landed at overseas bases by the fishing or transport vessels operating in the area.

Japan (Contd.):

The fish are subsequently "reexported" to Europe, the United States including Puerto Rico, and some may be shipped to Japan proper.)

5. Swordfish exports to the United States--5,500 short tons.

A general meeting of the Association was scheduled for March 17 when the export quotas were expected to be approved.

CANNED TUNA EXPORT PLANS OF TRADING FIRMS:

The Japan Canned Foods Exporters Association, for the purpose of developing export plans for the coming business year, conducted a survey of its 18 member firms handling canned tuna to determine the type and quantity of canned tuna in brine they hoped to purchase for export to the United States. In making the survey, the Association used two export targets, one of 2.8 million cases and the other of 2.5 million cases, and proceeded on the premise that 70 percent of the export target would be allotted to the exporting firms on the basis of merit (past performance record). The survey, the results of which are summarized in the table, indicates that buying by the trading firms would

FROZEN TUNA EXPORTS TO U. S. AND PUERTO RICO, JANUARY 1966:

Japan's exports of frozen tuna to the United States and Puerto Rico increased in January 1966, as compared with December 1965.

Japan's Exports of Frozen Tuna by Species to the United States and Puerto Rico, Jan. 1966 and Dec. 1965				
Species	1966 January		1965 December	
	Qty.	Value	Qty.	Value
	Short Tons	US\$ 1,000	Short Tons	US\$ 1,000
Albacore:				
United States. . .	2,105	815	846	349
Puerto Rico . . .	1,416	528	1,525	515
Total	3,521	1,343	2,371	864
Yellowfin:				
United States. . .	2,535	993	877	325
Puerto Rico . . .	308	93	930	231
Total	2,843	1,086	1,807	556
Big-eyed:				
United States. . .	60	20	-	-
Puerto Rico . . .	92	24	102	25
Total	152	44	102	25
Skipjack:				
United States. . .	117	33	-	-
Puerto Rico . . .	806	132	1,181	173
Total	923	165	1,181	173
Total United States	4,817	1,861	1,723	674
Total Puerto Rico	2,622	777	3,738	944
Grand Total . . .	7,439	2,638	5,461	1,618

Japanese Trading Firms' Canned Tuna in Brine Export Plans for 1966

Can and Case Size	Quantity Firms Hope to Export Based on Targets of				Actual 1965 Exports	
	2.8 Million Cases (Merit Quota: 1.96 Million Cases)		2.5 Million Cases (Merit Quota: 1.75 Million Cases)		(Utilization of Merit Quota)	
	Cases	%	Cases	%	Cases	%
Whitemeat						
6 lightmeat:						
7-oz. 48's	715,754	(36.5)	625,050	(35.7)	782,751	(36.0)
13-oz. 24's	389,603	(19.9)	352,943	(20.1)	478,133	(22.0)
4-lb. 6's	835,903	(43.6)	774,920	(44.2)	900,079	(41.4)
3 1/2-oz. 48's	-	-	-	-	11,777	(0.5)
6 1/2-oz. 48's	-	-	-	-	1,345	(0.1)
Total	1,961,260	(100)	1,752,913	(100)	2,174,085	(100)

be heaviest for the 4-lb. cans (6 cans per case), as in 1965. (Kanzume Nippo, January 22, 1966.)

Note: As of late February 1966, the canned tuna exporters and packers had not yet come to terms on the drafting of a new export agreement for business year 1966. The old agreement expired November 30, 1965, so a provisional agreement was adopted. The exporters were reported holding firm for a 70-percent merit and 30-percent adjustment quota, the packers a 40-percent merit and 60-percent adjustment quota.

Exports to the United States proper tripled in quantity and value. The quantity and value of exports to Puerto Rico dropped. (Fishes Attache, United States Embassy, Tokyo, March 31, 1966.)

EXPORT PRICE OF CANNED TUNA IN BRINE TO UNITED STATES:

Following the trend of several months, the Tokyo Canned Tuna Sales Company announced price rises for March sales of canned tuna in brine to the United States. The price increases varied from 90 cents a case (24 13-oz. cans) for lightmeat tuna to \$1.65

Japan (Contd.):

Export Price (f.o.b. Japan), Japanese Canned Tuna in Brine, March 1966

Type of Pack	March 1966 Price	Increase over Feb. 1966	Increase over Nov. 1965
(US\$/Case).		
Can & Case Size:			
Whitemeat:			
7-oz. 48's	11.80	1.30	2.90
13-oz. 24's	10.95	1.25	2.75
4-lb. 6's	12.55	1.65	2.75
Lightmeat:			
7-oz. 48's	10.05	1.10	2.90
13-oz. 24's	9.50	0.90	2.85
4-lb. 6's	10.90	1.45	2.45

a case (6 4-lb. cans) for whitemeat tuna. Compared with the price in November 1965, the increases amounted to \$2.65 a case for the lightmeat 13-oz. cans and \$2.75 for the whitemeat 4-lb. pack.

FROZEN SWORDFISH EXPORT VALIDATIONS TO U. S. AND CANADA, APRIL 1965-JANUARY 1966:

Japan's export validations of frozen broadbill swordfish (fillets, chunks, and "other" forms) to the United States and Canada in January 1966 totaled 403 short tons valued at US\$307,561. This compared with 433 tons valued at \$290,084 in January 1965 and 422 tons valued at \$300,319 in December 1965.

For the 10 months April 1965-January 1966, export validations of frozen swordfish to the U. S. and Canada totaled 3,939 tons valued at \$2,952,898. As in the previous 9 months, fillets accounted for 64 percent of the total. For the 10 months in the 1964/65 business year, frozen swordfish export validations totaled 3,396 tons, valued at \$2,196,638. (Fisheries Attache, United States Embassy, Tokyo, Mar. 31, 1966.)

EXPORTS OF FROZEN RAINBOW TROUT, JANUARY 1966:

Japan's Exports of Frozen Rainbow Trout by Country of Destination, January 1966		
Destination by Country	Quantity Short Tons	Value US\$
United States	70	56,045
United Kingdom	18	11,975
Canada	5	3,753
Netherlands	3	1,947
Australia	8	6,000
Other	2	1,950
Total	106	81,670

Japan's exports of frozen rainbow trout in January 1966 dropped in comparison with the exports in the previous month--about 40 percent in quantity and about 40 percent in value. Exports in December 1965 amounted to 181 short tons valued at \$135,787. Substantial decreases occurred in exports to all countries. (Fisheries Attache, United States Embassy, Tokyo, March 31, 1966.)

EXPORTS OF MARINE PRODUCTS, NOVEMBER 1965:

Japan's exports of marine products in November 1965 consisted principally of fresh and frozen fish valued at over US\$4 million

Japan's Exports of Marine Products, November 1965		
Product	Quantity	Value
	Metric Tons	US\$ 1,000
Fresh & frozen:		
Tuna, skipjack	1,032	156
Tuna, other	5,908	1,841
Marlin	673	556
Sea bream	853	153
Mackerel	139	25
Saury	1,687	450
Salmon	7	11
Other fish	2,503	1,033
Total fresh & frozen	12,802	4,225
Cured:		
Cod	5	5
Boiled and dried	36	17
Shark fins	95	164
Other	26	36
Total cured	162	222
Shellfish, etc., fresh, frozen, dried:		
Scallops	3	22
Oysters	19	22
Shrimp	153	325
Squid	694	167
Octopus (fresh)	104	42
Whale meat	1,516	325
Bull frog	72	131
Other	15	25
Total shellfish, etc.	2,576	1,059
Canned:		
Salmon	2,227	2,989
Tuna, skipjack	1,277	1,044
Tuna, other	1,753	1,644
Mackerel	2,486	919
Saury	201	83
Sardine	118	53
Horse mackerel	658	253
Other fish	1,953	1,864
Crab	399	1,153
Shrimp	8	56
Squid	449	166
Other shellfish	500	467
Total canned	12,029	10,691
Others:		
Seaweed, Kombu	65	36
Seaweed, laver 1/	212	11
Agar agar	20	78
1/In 1,000 sheets.		

Japan (Contd.):

and canned products valued at over \$10 million. (Fisheries Attache, United States Embassy, Tokyo, March 31, 1966.)

**JAPAN-COMMUNIST CHINA
(PRIVATE) FISHERIES AGREEMENT:**

Japanese private fishing interests and representatives of Communist China renewed their fisheries agreement for another two years from December 23, 1965. The previous agreement was effective December 23, 1963--also for two years. The new agreement is reported to impose stronger restrictions on Japanese fishing operations in the area covered. Primary differences between the new agreement and the one signed in 1963 are:

(1) Provisions to control the size of mesh in trawl nets and the catch of young fish; (2) creation of a special zone in which the number of fishing vessels which may operate is to be limited. The 1963 agreement merely called upon the Japanese "to take appropriate measures to prevent your fishing vessels from forcing Chinese fishing vessels from the said fishing ground" without imposing a specific limitation. Basic provisions of the new agreement are reported to be:

(1) Agreement to be effective for two years from December 23, 1965.

(2) Areas covered by the agreement are the high seas of the Yellow Sea and East China Sea north of 27° N. latitude and east of an approximate north-south line about 50 miles off the Chinese mainland.

(3) Establishment of 6 fishing zones and fishing seasons for each zone.

(4) Regulations governing mesh size; the taking of young fish.

(5) Regulations setting aside an area in the central Yellow Sea limiting the number of vessels which may fish there from October through February.

(6) Establishment of emergency ports of call in each country and providing for emergency assistance to fishing vessels.

(7) Both countries to conduct resource investigations and gear improvement studies and to exchange data.

(8) Both countries to settle fishery disputes and fishing violations in accordance with procedures established.

The joint communique issued by the parties claimed that the agreement made positive contributions in preserving the fish resources of the area, maintaining order in operations, and promoting friendship and co-operation between the people and the fisheries circles of the two countries, between whom diplomatic relations have not been restored. The parties expressed serious concern about and opposition to the "Japan-Republic of Korea Treaty" which "normalized" relations between Japan and South Korea. (Fisheries Attache, United States Embassy, Tokyo, April 5, 1966.)

Note: See *Commercial Fisheries Review*, January 1964, p. 61.

**SOUTH GEORGIA ISLAND
WHALING OPERATION TO CEASE:**

One of Japan's leading fishery firms has decided to give up whaling operations centering on use of South Georgia Island beginning with the next whaling season (autumn-spring 1966). The base has been used for three years. The firm has made its decision known to the British firm whose base it has leased. This Japanese company and two other Japanese whaling companies several years ago began

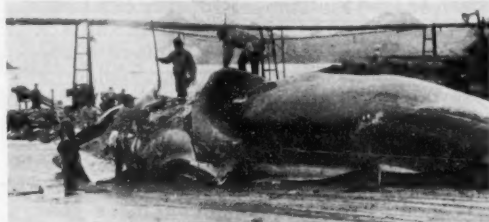


Fig. 1 - Stripping blubber from whale at Japanese land whaling station, Leith Harbour, South Georgia Island.



Fig. 2 - Portions of whale blubber awaiting processing at shore base at Leith Harbour, South Georgia Island.

Japan (Contd.):

hunting whales in the South Atlantic, using South Georgia Island as a base, for offsetting a reduction of Antarctic whaling quotas.

However, all of the whaling companies had been incurring a deficit for these operations owing to the smallness of their catches and the high fees they had to pay for renting bases. This led two of the companies to suspend further whaling operations in the season which began in the fall of 1964.

The third company had continued operations as its four-year base contract ran to 1966. The company decided to end the contract, moreover, as such base whaling might adversely affect Japan's future Antarctic whale quota. (*Japan Economic Journal*, April 5, 1966).

**Mauritania****FISHERIES DEVELOPMENTS:**

"Mauritania Intends to Establish a National Fishing Industry," was the title of an article in the March 19, 1966, issue of the French-language newspaper *Marches Tropicaux*. Among the items covered in the article are the following:

- (1) Six 112-foot stern trawlers have been ordered, to be built in France. The vessels will be refrigerated.
- (2) The Government of Mauritania intends to enforce its 12-mile fishing limit. To be able to obtain enforcement vessels, financial assistance is expected from France.
- (3) The Government plans to enter into bilateral agreements with other countries giving those foreign nationals the right to fish in the 6- to 12-mile zone provided that some or all of the catch is processed ashore in Mauritania.
- (4) It is planned to establish a mixed private industry-government fisheries corporation in Mauritania.
- (5) Plans are being made to build, at some future time, a fish meal plant in Mauritania with an annual capacity of 50,000 metric tons of raw fish to produce about 10,000 tons of meal. (Regional Fisheries Attache, United States Embassy, Abidjan, Ivory Coast, April 19, 1966.)

Note: See *Commercial Fisheries Review*, May 1966 p. 59.

**Mexico****SHRIMP FISHERY OF CIUDAD DEL CARMEN:**

Ciudad del Carmen in the State of Campeche is the leading shrimp port of Mexico's Gulf Coast. The entire economy of this city of 25,000 people is geared to the shrimp industry.

Shrimping started in the 1940's when fishermen and distributors from the United States Gulf Coast expanded their operations with Carmen as an advance base. At first, the fresh shrimp were flown to packing plants in the United States, but soon freezing plants were built in Carmen and all the shrimp were shipped frozen.

The profits were great, and before long Mexican investors began building vessels and freezing plants, until the industry is now nearly all Mexican, including the entire fleet, and only one plant is partly American-owned. For many years Carmen rode a boom, but eventually the catches leveled off and increasing costs narrowed the profit margin.



Shrimp fishing vessels at the dock in Mazatlan (on west coast of Mexico), the leading shrimp port. Ciudad del Carmen in 1964 was in second place.

Until the rapid rise of the Pacific Coast fishery in the late 1950's, Carmen was the leading shrimp port of Mexico. By 1963, Carmen was in third place, behind the West Coast ports of Mazatlan and Guaymas. In 1964, Carmen landings rose to a record high of 11,811 metric tons (live weight equivalent), up from 1963's total of 10,289. This increase, coupled with a slump in Guaymas, moved Carmen into second place behind Mazatlan. Although 1965 figures are not available, it is believed that Ciudad del Carmen held its position.

Ciudad del Carmen, an old colonial city, is located in a beautiful tropical setting on

Mexico (Contd.):

the island of the same name. All highway travel has to cross to the island by ferry. The island, along with two peninsulas, forms a very large lagoon known variously as Laguna de Terminos or Laguna del Carmen. The lagoon is one of the finest nursery areas for shrimp in Mexico and no shrimping is conducted in inside waters. A fleet of canoes and small launches fishes for finfish in the lagoon, but this fishery for the local market is relatively unimportant. Of all Mexico's shrimp ports, none is closer to complete concentration on shrimp alone than Carmen.

Ciudad del Carmen is home port to a fleet of 252 shrimp trawlers. Some of these range afar and occasionally land their catches at other ports, and vessels from other places also sometimes land their catches at Carmen. The vessels stay at sea up to 12 days, although some of the smaller ones are limited to trips of 6 or 8 days. All use ice to preserve their catches. Although manned by members of fishermen's cooperatives, most of the vessels are owned by private individuals or by the plants for which they fish. For example, all 35 vessels fishing for one plant are owned by individuals, whereas another plant of similar size owns 17 vessels or about half of the fleet serving it. When catches are temporarily poor, some of the vessels leave Carmen and neighboring ports and fish for freezing plants located on the Nicaraguan-Caribbean coast.

The waterfront along the lagoon shore is lined with an almost unbroken row of shrimp-freezing plants and boatyards serving the fleet. Eight freezers are now in operation. Shrimp at Carmen are smaller than at nearby Campeche, hence much of the production is peeled and deveined or butterfly shrimp individually quick frozen, which permits better use of the predominant medium sizes. About 80 percent of all production is of this type. Only the largest sizes are shipped as heads-off, shell-on. The small sizes are shipped to the Mexico City market, mostly peeled and cooked. All export shipments are made by refrigerated truck.

All of the approximately 8 small boatyards in Carmen are kept busy with maintenance work on the shrimp fleet. In addition, 9 new trawlers are reportedly under construction or being outfitted. In mid-March 1966, every

marine railway was occupied and other boats were awaiting their turn. Also all ship chandlers were busy. In August 1966, vessel owners and fishermen's cooperatives will negotiate new operating contracts and apparently everyone is dreading a possible impasse like the one that tied up the West Coast industry in September 1965. (United States Embassy, Mexico, April 13, 1966.)

TREND IS TOWARD INCREASED NATIONALIZATION OF FISHERIES:

It appears more and more likely that the trend toward nationalization of Mexico's fisheries will increase. In early 1966, plans were being developed to increase financial support of the Government-controlled fishing installation at the port of Alvarado on the Gulf of Mexico. This action was being considered in spite of public complaints that the Alvarado operation has not been economically sound. A new Government five-year plan was also proposed which indicated even more nationalization of the fisheries, with credit facilities for Federally-operated fishing enterprises, and probable Government influence on prices for fish and fishery products. Cooperatives would also receive more Government financial backing, according to the plan.

The Government is justifying increased nationalization of fisheries on the basis of: (1) Increased foreign exploitation (primarily U. S., Japanese, and Soviet) of fishery resources off the coasts of Mexico; (2) the recent declining condition of the Mexican fishing industry; and (3) the national plan to increase production, domestic consumption, and exports of fishery products substantially within the next five years. (Various sources.)



Morocco

SHRIMP SHORTAGE IN TANGIER:

A shortage of shrimp in Tangier was reported by the local press in early April 1966. Shrimp was becoming increasingly scarce in the city and what was available was selling for US\$2 to \$3 a pound whereas shrimp had never before sold in Tangier for more than 50 cents a pound. Part of the shortage was reported to be due to exports to France and Spain of most of the locally-caught shrimp.

Morocco (Contd.):

(United States Consulate, Tangier, April 15, 1966.)

SARDINE FLEET RECOVERS FROM STORM DAMAGE:

The Safi fishing fleet, damaged by a severe storm which lashed the Moroccan coast the night of February 20-21, 1966, was being rapidly repaired and the losses did not appear to be as grave as initially feared. The prompt action by the Government and the vessel owners to refloat and repair the vessels was successful. About 75 vessels of the 125-boat sardine fleet were ready to sail by May 1. About 40 of the sardine boats were lost.

The lack of insurance on many of the boats was also not as severe a blow as expected since during the off-season many of the boats were stripped of nets, radios, and other equipment. (United States Embassy, Rabat, March 23, 1966.)

TANGIER SARDINE AND TUNA CANNING SEASON:

Early in April 1966, the major fish cannery in Tangier was making preparations to begin its third season of tuna canning. The company's giant madrague nets (large beach seines) were being placed in position, and canning operations were expected to begin in late April.

Local industry officials were pessimistic as to the future of canning and fishing in Morocco. The company will export more fresh fish (sardines) this year, rather than can. The company points out that it can obtain nearly double the price for the fresh fish it exports than that received for the canned product, and this helps to cut increasing operating costs which eat into profits. The company has also experienced the effect of recent credit restrictions. At the beginning of each season the company must make considerable financial outlays to purchase packing oil, salt, and the cans necessary in canning operations. Without bank credits, the company is hard put to make these necessary purchases.

The Tangier fishing fleet from 35 vessels has been reduced to 7 in service and will soon

number only 5 as actively engaged in fishing on a commercial scale. Several reasons were given for this situation. First, the Moroccan Government has prohibited the fishing vessels from calling at nearby Spanish Ceuta. Moroccan fishing boats had previously sold their catches in Ceuta at nearly double the Tangier prices; they could also buy fuel and make repairs in Ceuta at less expense than in Morocco. Added to this was the fact that the bottom has literally fallen out of the fish market in Tangier. Fish prices in Tangier have been extremely low all winter and are the lowest in Morocco. This price problem is made worse by the local regulation making it difficult for the local fishermen to move their catch out of Tangier to other domestic markets. Tangier fishermen are also disappointed over the failure of the national Government to construct the long-promised central fish market. It was also reported that marine credits have not been forthcoming to enable repairs on the fishing vessels and engines. This reportedly results from the fact that the present Tangier fish mart is not integrated under the law which applies to other Moroccan ports whereby the Government can withhold the proceeds from the sales of fish to repay loans granted to fishermen from the banks. Finally, the members of the fishermen's union are continually demanding increased wages. They recently struck for a wage hike ten days before the madragues were scheduled to be set.

Given the factors enumerated above, it was considered that this year will prove to be a difficult one for the Moroccan fishing and canning industry. The local sardine cannery had received no orders for canned sardines and the sardine cannery would therefore be unprepared if orders finally materialize. This was due to the inflated price of canned sardines stemming from the OCE nationalization of canned fish exports. It was also noted that there was almost a complete absence of shrimp in the northern waters. The opinion was expressed that there was a great deal which the local and national governments could do to help ease the situation, but nothing was being done.

After the recent destruction of many fishing vessels at Safi because of a violent storm, Tangier fishermen had been hopeful that the Safi interests would come to Tangier to purchase the idle boats with insurance money received for their sunken craft. However, the Government insurance has required that the

Morocco (Contd.):

damaged and sunken craft be first repaired before any insurance money would be paid, even if this entailed an outlay of additional funds on the part of the vessel's owner above the value for which it had been insured. Thus the prospect of sales of the idle craft seems dim. (United States Consulate, Tangier, April 8, 1966.)

NEW FISH COMPLEX PLANNED:

A fish-processing complex may be built at Al Hoceima on the central Mediterranean coast of Morocco, according to the Moroccan press. Included will be an ice and cold-storage plant and a cannery. The cold-storage plant will store fish to be processed in the cannery during the off-season for fishing. (United States Consulate, Tangier, April 15, 1966.)

AGAR-AGAR PLANT TO MOVE FROM TANGIER:

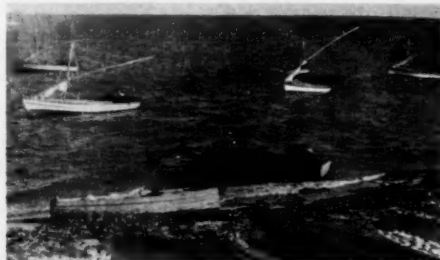
The director of the company in Tangier which produces agar-agar, reported that his company decided to transfer their plant from Tangier to El Jadida. The decision to move was made by the company's head office in Italy, primarily to reduce operating costs by relocating the plant at the source of its seaweed raw material, which is near El Jadida. The company produces about 120 metric tons of agar-agar annually, 30 percent of which is exported to the United States. The relocation of the plant at El Jadida will have the additional advantage of being close to Casablanca from where all the company's shipments to the United States are made. The company encountered considerable difficulty in making shipments directly from Tangier to the United States. It was unable to find regularly scheduled ships going to the United States from Tangier and, therefore, sent its shipments to the United States via Casablanca, which entailed additional transportation costs. The move was scheduled to begin the end of July 1966 and requires about five months to be completed. Of the staff of 45 employees, only about 12 will move with the plant to El Jadida. (United States Consulate, Tangier, April 6, 1966.)

**Mozambique****FISHERIES PRODUCTION, 1961-1965:**

At the end of 1962, the Mozambique fishing industry employed 13,717 fishermen who used 4,128 oar or sail boats and 92 motor-

Fisheries Production, 1961-1965					
Species	1/1965	1964	1963	2/1962	2/1961
	(Metric Tons)				
Fish, unspecified . . .	3,319	3,508	2,545	-	-
Clams	196	164	158	-	-
Shrimp	386	262	383	-	-
Shellfish, other (including spiny lobster and crab)	257	418	284	-	-
Total	4,158	4,352	3,370	3,257	3,285
1/For January through September only. Estimated total for the year, 4,425 metric tons.					
2/Species breakdown not available.					

driven craft. Since 1962, there has been an increased interest in the fishing industry. One company remains dominant in the industry. This company displayed a variety of fishery products for export, including canned and otherwise preserved shellfish, at a trade and industrial fair in Lourenco Marques during July-August 1965.



Typical fishing craft operating out of Lourenco Marques, Mozambique.

In 1965, a spiny lobster fishing and export company, with two United States shareholders, declared its voluntary bankruptcy. For several years, this company was Mozambique's only lobster tail processing and export company, with an assured distribution in the United States. (United States Consulate, Lourenco Marques, March 28, 1966.)

**Netherlands****FISHERY LANDINGS, 1964-1965:**

Fishery landings in the Netherlands in 1965 totaled 320,655 metric tons with an ex-

Netherlands (Contd.):

Netherlands Fishery Landings, 1964-1965						
Species	1965			1964		
	Quantity Metric Tons	Value		Quantity Metric Tons	Value	
		Fl. 1,000	US\$1,000		Fl. 1,000	US\$1,000
SALT-WATER FISH:						
Groundfish:						
Haddock.....	24,291	7,375	2,049	14,892	4,816	1,338
Cod.....	17,585	11,059	3,072	9,117	6,451	1,792
Saithe.....	7,767	3,286	913	4,082	2,004	557
Whiting.....	8,063	2,775	771	5,949	2,701	750
Ling.....	321	190	53	227	141	39
Hake.....	35	47	13	45	53	15
Eel.....	223	999	277	271	992	276
Other groundfish.....	2,533	1,449	402	1,425	815	226
Total groundfish.....	60,818	27,180	7,550	36,008	17,973	4,993
Flatfish:						
Plaice.....	20,738	14,618	4,060	22,233	11,291	3,136
Fluke.....	490	166	46	510	144	40
Dab.....	1,204	595	165	949	436	121
Sole.....	11,592	45,674	12,687	7,463	39,740	11,039
Other flatfish.....	1,591	4,698	1,305	1,607	4,071	1,131
Total flatfish.....	35,615	65,751	18,263	32,762	55,682	15,467
Herring:						
Fresh.....	37,323	16,928	4,702	56,708	16,255	4,515
Salted.....	34,850	28,307	7,863	47,697	30,088	8,358
Sprat.....	3,756	773	215	4,856	539	150
Other herring-like fish.....	1,359	315	87	470	148	41
Total herring & herring-like.....	77,288	46,323	12,867	109,731	47,030	13,064
Mackerel.....	17,960	5,294	1,471	17,531	5,421	1,506
Miscellaneous salt-water fish 1/.....	4,294	676	188	2,888	390	108
FRESH-WATER FISH:						
Eel.....	2,275	9,200	2,555	1,984	7,127	1,980
Other fresh-water fish 2/.....	10,647	1,298	361	9,396	1,239	344
Total fresh-water fish.....	12,922	10,498	2,916	11,380	8,366	2,324
SHELLFISH:						
Oyster.....	716	4,586	1,274	557	3,436	955
Mussels.....	96,084	11,444	3,179	100,714	12,009	3,336
Shrimp.....	8,047	17,289	4,802	8,886	11,327	3,146
Other shellfish 3/.....	6,911	480	133	9,210	501	139
Total shellfish.....	111,758	33,799	9,388	119,367	27,273	7,576
Grand Total.....	320,655	189,521	52,643	329,667	162,135	45,038

1/Mostly immature fish.

2/Mostly whitebait.

3/Mostly immature shrimp.

Source: Netherlands Central Bureau of Statistics.

vessel value of fl. 189.5 million (US\$52.6 million). Compared with the previous year, that was a drop of 3 percent in quantity, but a gain of 17 percent in value.

The decline in quantity was due to a drop in herring landings. The decline was almost offset by increased landings of haddock, cod, other groundfish, and sole. The increase in value was due to higher prices for shrimp and herring as well as the heavier landings of groundfish and flatfish.



Nigeria

NEW SHRIMP FISHING
ENTERPRISE FORMED:

On February 24, in Enugu, representatives of the Government of Eastern Nigeria and a

group of American investors signed agreements establishing a joint shrimp-fishing company. The American group, with 75 percent of the equity capital, will have a controlling interest in the firm.

The new enterprise, registered as Sea Harvest Nigeria Ltd. (SHN), will operate a fleet of trawlers (initially 13 in number) in the Bights of Benin and Biafra, under the direction of an American citizen with long experience in shrimp fishing in the Gulf of Mexico. The shrimp catch, expected to be about three million pounds a year at the start, will be frozen and packaged at a Port Harcourt plant for export to the United States. Other catch is to be marketed locally. Some consideration is being given to the possibility of processing industrial fish into fish meal and fish protein concentrate.

Nigeria (Contd.):

SHN's backers are hopeful that further proving of the still relatively virgin Nigerian shrimp-fishing grounds will justify rapid expansion of the company's fleet. (United States Consulate, Enugu, March 25, 1966.)

FROZEN FISH MARKETING AND DISTRIBUTION:

Four fishing companies in Lagos land and distribute throughout Nigeria 4,000 to 5,000 metric tons of frozen fish each month.

Three of the companies, corporately inter-related and in part owned by the Nigerian Government and Liberian-Danish-Greek interests, handle about 30 percent of the frozen fish marketed annually in Nigeria. Their fish is obtained entirely from foreign-owned factory trawlers (Japanese and Polish) based in Nigeria but fishing in waters 1,500 to 2,000 miles distant. One of these companies has 300 tons of cold-storage capacity. Another of the companies has 1,500 tons of cold-storage space. Some of the frozen fish is shipped to the northern part of Nigeria in a refrigerated railway car owned by a local Nigerian-American food company which brings beef to Lagos from the north.

The fourth fishing company, owned and operated by a local family, handles 70 percent of the frozen fish landed and distributed in Nigeria. This company owns 3 Japanese trawlers, each 165 feet long, with a 180-ton carrying capacity, and 2 Soviet trawlers of slightly smaller size. The vessels carry a 50-percent Nigerian crew and are based in Nigeria. The company selected Nigerians for these trawlers for the purpose of training and eventually having the vessels completely Nigerian-manned. The company has instituted a program aimed at acquiring men with a minimum of 4 years of secondary education and preferably 6. This endeavor is working out well with a retention of approximately 90 percent to further complete the Nigerianization of operations.

The company has stressed the need for a Federal Fisheries School, and, to this end, a proposal for the formation of such a school has been formulated by the Federal Service.

This company has decided to embark on a shrimp-fishing venture, a decision which was

influenced in a large measure by positive results of reports from the Federal Fisheries Office and of AID-sponsored trawling operations which clearly indicated a shrimp potential. This will consist of three trawlers now being built in Japan, with 51 percent Nigerian interest and 49 percent Japanese. Marketing for these trawlers will be handled by the Japanese for export to Japan. The trawlers will be under 60 feet in length since this is an acceptable size for economical fishing, and, in addition, will comply with existing minimum Nigerian manning regulations. The company feels that this type of vessel can be entirely Nigerian-manned in a shorter length of time. The three vessels will be delivered before the end of 1966.

Another 5 vessels are being constructed by an Austrian firm, the first 2 of which will be delivered about September and the remainder in early 1967. These vessels will be owned outright with a ten-year repayment period. They are 59 feet long and of simple design. It is expected that marketing of the shrimp from these vessels will be done through U. S. buyers.

The company is planning a new shore installation. This will include a processing plant, dock, ice-making facilities and storage. The storage facility as well as a small ice plant are already in operation.

The company feels that the fishing interests of Nigeria can be served best by lending assistance in the field of research and exploratory work on the sea fishery as well as introducing a proper training school. It is believed that the build-up of an indigenous trawler fleet would be impossible without the requisite trained manpower and capital to purchase new boats. The company and others will be in a position to buy the products from such fleets.

The company has fairly extensive cold-storage facilities (at about 13 locations) in Lagos, and the Eastern, Midwestern, and Western Regions of Nigeria. These range in size from 40 to 50 tons capacity to about 3,000 tons. The company plans to continue expansion and ultimately hopes to increase monthly fish hauls from the present 3,000 to 12,000 metric tons a month. (United States Embassy, Lagos, March 31, 1966.)



Norway

HERRING AND COD FISHERY TRENDS, MARCH 19, 1966:

Herring: As of March 19, the 1966 Norwegian herring catch amounted to 4.86 million hectoliters (452,000 metric tons) and the capelin catch amounted to about 863,000 hectoliters (80,260 tons). That was about double the catch of herring and capelin during the same period of 1965. Fish meal and oil plants absorbed all of the 1966 capelin catch and 80 percent of the herring catch.

Cod: The Norwegian catch of spawning and Finnmark cod as of March 19, 1966, totaled 42,183 tons of which 11,077 tons went for filleting, 10,038 tons for drying, 16,230 tons for salting, and 4,838 tons for fresh consumption. The 1966 cod fishery off northern Norway has been somewhat more productive than in the past two years when catches were very light. (Fiskets Gang, March 24, 1966.)

BAN ON FOREIGN FISHERY LANDINGS MAY BE RELAXED:

The Norwegian Government plans to ask Parliamentary approval of a new landings law. While retaining a general ban on foreign landings, the new bill would allow the issuance of special landing permits for foreign-caught fish provided such landings do not disrupt prices and other marketing conditions in the domestic or export markets for Norwegian fish. Foreign landings would also be permitted when necessary to implement international agreements, and in cases of vessels in distress. A shortage of fish, especially groundfish, for processing is the reason for the new proposal. (United States Embassy, Oslo, April 10, 1966.)

WHALING FACTORYSHIP MAY BE SHIFTED TO HERRING FISHERY:

As of early March 1966, Norway's two Antarctic factoryship fleets--*Kosmos IV* and *Thorshavet*--reported very poor whale catches for the Antarctic season. On March 8, 1966, the operators of *Kosmos IV* announced that the vessel would probably be withdrawn from pelagic whaling after the present season for use as a factory-freezer vessel in the Norwegian coastal herring fishery. This is another move in the gradual liquidation and conversion of Norwegian whaling vessels.



Pakistan

12-MILE FISHING LIMITS DECLARED WITH RIGHTS TO EXTENDED "CONSERVATION ZONES":

On February 19, 1966, the President of Pakistan proclaimed exclusive fishing rights for Pakistan within a distance of 12 nautical miles from the coastline.

In the Proclamation, Pakistan also claimed the right to establish conservation zones to a distance of 100 nautical miles from the outer limits of territorial waters, and to regulate fisheries in the zones so established, subject to the provisions of any international agreement or convention to which Pakistan is or may become a party. (United States Embassy, Rawalpindi, February 23, 1966.)



Panama

INTEREST IN DEVELOPING THE FISH MEAL INDUSTRY INCREASES:

In early April 1966, at least 6 new potential investors (4 Panamanian, 2 American) were known to be investigating the feasibility of establishing fish-meal enterprises in Panama. One investor had established a company and was negotiating for the purchase of a fish meal plant, probably from Peru.

Suppliers of fish-meal equipment, nets, marine hardware, and similar items may wish to investigate sales of those items in the Republic of Panama. Initial inquiries could be directed to the U. S. Embassy in Panama. The importation of fishing vessels into Panama generally is prohibited and vessels used in the domestic industry normally must be constructed in Panama.

All of the four proposed new plants on which there is definite knowledge are to be built on the Bay of Panama, near Panama City on the Pacific side of the Isthmus. It is assumed that any additional plants constructed in Panama also would be located on the Bay of Panama, the primary fishing area in the Republic for anchoveta and thread herring, the raw material for the industry.

One group was known to be interested in the possible construction in Panama of large fishing vessels for the express purpose of fishing for anchoveta and thread herring.

Panama (Contd.):

The remaining groups hoped to convert local shrimp vessels to supply their fleet needs.

The Director of Panama's Bureau of Fisheries expressed concern that Panama may face a too rapid development of its fish-meal industry. He stated that no definitive information is available concerning the anchoveta and thread herring population in Panamanian coastal waters. He advised that he has counseled potential investors to limit the size of their initial plants pending the development of more precise information concerning the extent to which Panamanian waters can support this new local industry. According to the same official, the Government currently has no plans to limit the number of licenses issued for the construction of fish-meal plants since Panamanian law requires that all potential new investors in the industry must be treated in the same fashion as previous applicants for licenses. However, should it appear the industry is growing too rapidly, steps undoubtedly would be taken to restrict fishing or plant construction with a view to exercising some degree of fish conservation. The fear also has been expressed that the new industry might result in a major diversion of vessels away from local shrimp fisheries. (United States Embassy, Panama, April 7, 1966.)

SHRIMP CATCH AND EXPORTS, 1965:

In 1965, Panama's shrimp catch totaled 12,900,275 pounds and was divided by species as follows: white--4,990,911 pounds; pink--2,841,073 pounds; "titi"--4,161,672 pounds; tiger--831,472 pounds; and "solenoceras"--75,206 pounds. The value of the catch was not given. Good catches of white and pink, the preferred species, brought high prices and offset the fact that the total shrimp catch was below the 1964 level of 15,500,000 pounds. Panamanian shrimp imports were valued at \$600,000 in November 1965, and \$630,000 in December 1965. (United States Embassy, Panama, March 23, 1966.)



Peru

FISH MEAL AND OIL SITUATION, MARCH 1966:

Peruvian anchovy landings for October 1, 1965-February 28, 1966, were estimated at

5.5 million metric tons, only 1.5 million tons short of the quota-limit established by the Government for the current season (October 1, 1965-June 30, 1966). The quota-limit was expected to be reached by late April or early May. Plant owners want the Government to increase the catch quota and reduce the length of the closed season (July through September 1966). The fishermen are also concerned over the prospects of being four or more months out of work.

Fish meal production remained at high levels during the early months of 1966: January--242,380 metric tons; February--179,330 tons; March 1 to 15--90,000 tons (estimated). The anchovy resource situation over the long term, however, is still doubtful because of the large proportion (60 percent) of immature fish being taken which was resulting in considerably less oil production than would otherwise be obtained from adult fish. Anchovy catches in early 1966 were estimated as follows: January--1,740,000 metric tons; February--1,830,000 tons; March 1 to March 15--970,000 tons. (United States Embassy, Lima, March 30, 1966.)



Poland

FISHERY AID TO SYRIA:

In December 1962, Poland and the Syrian Arab Republic signed an agreement for economic cooperation which was enlarged by a supplementary protocol in June 1965. The protocol provides for the exportation to Syria of Polish fishing vessels, as well as for their maintenance (presumably by Polish technicians).



Portugal

CANNED FISH EXPORTS, 1965:

Portugal's total exports of canned fish in oil or sauce during 1965 were up 18 percent from 1964, due mainly to larger shipments of sardines and mackerel. Sardines accounted for 75 percent of the total canned fish exports in 1965.

Portugal's principal canned fish buyers during 1965 were Germany with 18,758 metric tons, Italy 13,866 tons, the United Kingdom 8,417 tons, France 5,535 tons, the United

Portugal (Contd.):

Portuguese Canned Fish Exports, 1964-65				
Product	1965		1964	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In oil or sauce:				
Sardines	61,383	3,230	55,272	2,909
Chinchards	2,667	140	3,305	174
Mackerel	10,310	412	5,349	214
Tuna & tunalike	3,456	115	2,097	70
Anchovy fill/ ts	3,634	365	3,247	325
Others	794	42	665	35
Total	82,264	4,304	69,935	3,727

States 6,372 tons, and Belgium-Luxembourg 5,432 tons. Italy's purchases of canned fish from Portugal in 1965 were up 70 percent from 1964, and purchases by Germany were up 34 percent. (Conservas de Peixe, February 1966.)

CANNED FISH PACK, 1965:

The Portuguese total pack of canned fish in oil or sauce in 1965 was about the same as in 1964. A decline in the important sardine pack was offset by a sharp gain in the mack-

Portuguese Canned Fish Pack, 1964-65				
Product	1965		1964	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In oil or sauce:				
Sardines	56,147	2,955	70,209	3,695
Chinchards	2,330	122	1,542	81
Mackerel	13,055	522	4,211	169
Tuna & tunalike	7,253	242	5,931	196
Anchovy fillets	4,232	422	3,002	300
Others	1,838	96	737	39
Total	84,855	4,359	85,632	4,480

erel pack and some increase in the pack of tuna, chinchards, and anchovy fillets. (Conservas de Peixe, February 1966.)

MODERN VESSEL JOINS COD FLEET:

In early April 1966, the Cidade de Aveiro, a modern cod vessel valued at US\$1.75 million was launched in Portugal. It is the only vessel in the Portuguese cod fleet to be propelled by an electric diesel engine. The vessel will fish off the coasts of Greenland and Labrador and will have a storage capacity of 1,300 metric tons of salted and frozen fish.

At the launching ceremony, the Portuguese Minister of Marine noted that the Cidade de Aveiro was one of three new cod vessels (the other two will be ready in July and October 1966) envisaged under the Intercalary Devel-

opment Plan to bring the supply of cod in line with demand. He added that 35 Portuguese fishing vessels with a total value of 541,500 contos (US\$18,952,500) were either under construction or would be by the end of 1966.

An increase in the cod catch will be welcome in Portugal where dried cod (bacalhau) is a favorite dish. Last year, over 5,000 tons of cod had to be imported to supplement local production. (United States Embassy, Lisbon, April 12, 1966.)



South Africa

PELAGIC SHOAL FISH CATCH UP IN 1965:

The combined shoal fish catch for South and South-West Africa was 1,261,710 short tons in 1965, compared with 1,194,635 tons in 1964.

A significant rise in the anchovy catch contributed to the record total shoal fish catch made by the South African industry in 1965. The South African anchovy catch rose from 104,630 metric tons in 1964 to 194,673 tons in 1965 and the total pelagic catch rose from 471,578 tons to 526,777 tons.

On the other hand, the South African pilchard catch fell from 282,301 tons in 1964 to 224,890 tons in 1965. Included in the total of 526,777 tons are 63,374 tons of maasbanker and 43,840 tons of mackerel.

The pilchard catch in South-West Africa reached 734,299 tons in 1965, compared with 723,057 tons in 1964; and the 634 tons of anchovy which were also caught brought the shoal total for the year to 734,933 tons.

The fish meal processed from the shoal fish catch totaled 124,122 tons in South Africa and 175,964 tons in South-West Africa, a total for 1965 of 300,086 tons. The comparable figure for 1964 was 283,989 tons.

The December catches which contributed to the 1965 totals were: In South Africa, 1,215 tons of pilchards, 1,036 tons of anchovy, and 2,344 tons of maasbanker.

According to the Division of Sea Fisheries, during December no pilchards were canned in South Africa, but a total of 410,280 pounds of maasbanker were canned. The total prod-

South Africa (Contd.):

uction of fish body oil in South Africa during the month was 33,613 imperial gallons.

The total production of fish body oil in South Africa reached 4,863,605 imperial gallons during 1965. During the year, 2,905,992 pounds of pilchards were canned in South Africa together with 10,097,328 pounds of maasbanker and 9,865,680 pounds of mackerel, making a total of 22,869,000 pounds. (South African Shipping News and Fishing Industry Review, February 1966.)



South Africa Republic

HAKE FINDS GOOD MARKET IN GREAT BRITAIN:

Cape hake which South Africans had no part in catching was in the news in January 1966 in the port of Fleetwood on the north-west coast of England. One of the four major centers of the British trawling industry, Fleetwood was hard hit when many trawler crews would not go to sea in the Christmas-New Year holiday period.

As a result, in early January landings fell sharply and fresh northern hake was one of the species in short supply. The price rose to a high of about US\$93.00 a 140-lb. box (61 cents a lb.) wholesale and merchants turned to supplies of frozen hake available at about a third of that price.

The frozen fish was hake caught off South Africa by Japanese fishing vessels.

As supplies of fresh hake picked up, the demand for the frozen product fell off again. The British consumer, however, was reported becoming accustomed to this import from South Africa and difficulties in finding the northern hake point to a steady increase in demand from the United Kingdom.

But great care has to go into the preparation of fish exports to this highly discriminating market. The right quality will only be obtained when the South African hake is frozen aboard soon after it is caught. Chilled fish taken by Cape Town trawlers, landed in ice and then frozen is not the product expected to find increasing acceptance in Britain in the future.

British trawler owners may decide to join the foreign fleet fishing off Southern Africa. This year the number of freezer stern trawlers operating mainly out of Hull and Grimsby will be nearly doubled. Those vessels, ranging in size from 700 to 1,700 gross tons, are at sea for periods of 40 to 50 days and bring in catches of 400 and 500 metric tons.

In the designs of several of them there is provision for their transfer to far distant waters and the presence in South Africa of representatives of the White Fish Authority and of the Torry Research Station is an indication of British interest in that area. (South African Shipping News and Fishing Industry Review, February 1966.)

RECORD WHALING SEASON IN 1965:

The South African 1965 offshore whaling season was a record one, according to the annual report of one South African whaling company. The highest production was achieved since the company discontinued its Antarctic whaling operations--a record for the value of production during the season and the greatest number of whales ever taken in one season.

The Chairman announced that for the first time, in the 1966 season, a restricted catch would be applied to the company's offshore whaling.

This development results from a meeting of the International Whaling Commission in London in June 1965 when a recommendation from a special meeting held in May was adopted restricting the catch of baleen whales by land-based stations.

The Commission recommended that the Governments concerned should restrict baleen whaling operations from land stations in the Southern Hemisphere during 1966 on a voluntary basis as an interim measure. The recommendation was later accepted by the South African Government.

The company's report revealed that this decision would reduce the 1966 catch of baleen whales to 90 percent of the previous year's catch. This would mean that about 750 baleen whales could be taken, compared with 826 last year.

Baleen whales formed about one-third of the total season's catch.

South Africa Republic (Contd.):

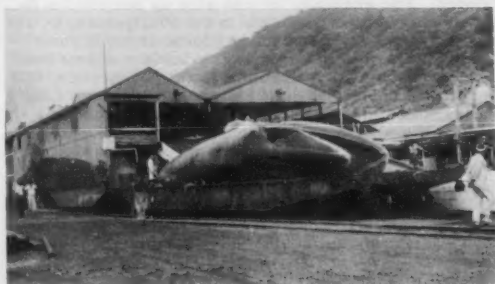
Reviewing the 1965 season, the Chairman said that the weather in the latter part had been most favorable, as had been the case for the past few years. Of the 234 days of the season, 66 were lost when ships were weather-bound, compared with 76 "lost" days out of a total of 236 in the 1964 season.

There had been no significant reduction in the average size of whales taken. It was difficult to draw any definite conclusion whether the general increase in the number of whales taken had resulted from greater catching effort or from more favorable weather. A third possibility was that this might be an indication that the stock of whales on which the company was drawing was not being overtaxed.

Of the coming season, he said that last year he had referred to the company's intention of making provision for processing the whole of the crude sperm oil production. It has been decided to defer this action for the time being.

This was partly on account of the substantial increase in the production of crude sperm oil and partly because the plant in use was apparently capable of meeting the existing demand for processed sperm oil. As a result, the company would continue to market a portion of its sperm oil production as crude sperm oil.

In the 1965 season, the price for crude sperm oil was substantially the same as for the previous season, but the company had sold forward some of its expected 1966 production at somewhat higher prices.



Fin whale being transported to plant in Durban, South Africa.

Last season there were 12 catchers operating, 2 more than in the previous season, and of those, 4 were fitted with ASDIC equip-

ment. While the additional craft increased operational costs, they had also contributed to the increased catch.

As in the past few seasons, two spotter aircraft had been employed to assist in locating and tracking whales, and to report back to the catchers.

The company's products were sold in 16 foreign countries including Chile, Mexico, Switzerland, Zambia, and Colombia.

A breakdown of the season's total catch shows that of the 3,640 whales, there were 826 baleen whales (6 blue whales, 361 fin, and 459 sei whales). The balance of 2,814 was sperm whales.

The 1966 season opened on February 1 when five catchers went into commission in search of sperm whales, which are the only type which can be taken in the early stages of the season. As conditions improved and whales became more plentiful, the number of catchers were increased to 12--the same as last year. (*The South African Shipping News and Fishing Industry Review*, February 1966.)



South-West Africa

BOAT OWNERS REQUEST
INCREASE IN PILCHARD PRICE:

The Walvis Bay Fishing Boat Owners Association requested a price increase from about US\$12.38 a metric ton to about \$14.06 for pilchards delivered to the 7 Walvis Bay fish factories. As of March 18, 1966, the factory owners had not yet replied. The boat owners requested the increase on the following grounds:

The world price for fish meal has doubled since the price of raw fish was last fixed and it is felt that a fair share of the product profits should be passed on to the primary producer. The cost of replacing vessels has doubled since the last increase was granted. The cost of maintenance has doubled since the last increase was granted. The cost-of-living generally has increased substantially since the last increase was granted. (*Namib Times*, Walvis Bay, March 18, 1966.)



Spain

SIGNALS USED BY PAIR TRAWLERS IN NORTHWEST ATLANTIC:

Spanish pair trawlers began fishing off New England in the vicinity of Georges Bank, in the spring of 1966.

Following is the text of Spanish regulations governing signals to be used by Spanish pair trawlers operating in the Atlantic Ocean off the northeastern coast of the United States:

(1) Vessels engaged in trawling in pairs must, upon the approach of another vessel, in order to keep the latter from passing between the two vessels forming the pair, display a torch or flare alongside the net, in addition to other required signals.

(2) In the daytime, for the same purpose, two black spheres or bodies, 0.61 meter (2 feet) in diameter, shall be raised vertically at least 1.20 meters (3.9 feet) apart, with a pennant above them.

(3) The two vessels forming the pair shall display the signals by day and by night.



Taiwan

FISHERIES DEVELOPMENT TRENDS:

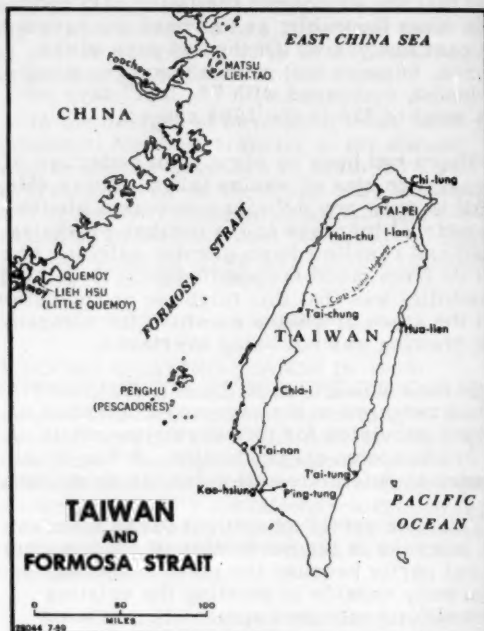
Taiwan's fishing industry has been developing rapidly and today ranks second only to Japan in Southeast Asia. During the annual convention of the China Fisheries Association in Taipei (December 12, 1965), K. T. Li, the Minister of Economic Affairs, in a speech regarding the further development in the fisheries of Taiwan said, in part:

The first problem I would like to bring up concerns the potential for future fisheries development. Fishing activities have shown a gradual decline due to the shortage of labor in such industrialized countries as the United States, Great Britain, Japan, and West Germany. This offers a golden opportunity for the developing countries having low-cost and abundant labor to fill the gap. We are in a position to take advantage of it:

(1) In respect to manpower, we are blessed with a large supply of industrious and intelligent labor.

(2) Among sources of funds available for fisheries development, can be the idle local capital. Through proper arrangements and guidance, it can be directed toward investment in fisheries. Foreign financial assistance in the form of equity or loan capital can also be obtained. Already several American fish canneries have expressed their willingness to extend loans for

boat construction in Taiwan. Another significant source of funds is the World Bank, whose loans may continue to be available as long as we can set up bankable projects.



(3) The United States and several European countries have large and ever-increasing demand for import of fish products. Japan, the largest fish-producing country in the world until 1964, used to export nearly US\$300 million of fish annually, but its exports have been falling and imports rising since three years ago with yearly imports of fish products exceeding US\$60 million in 1964. At present, frozen tuna and shrimp constitute the bulk of our fish exports. I hope that fish canning will be developed and foreign markets for canned fish further explored. For example, we can step up our efforts for the export of canned sardines to the Philippines, to take advantage of the fact that the products of the Union of South Africa are in disfavor in the world markets because of racial discrimination. In this connection, it is significant to note that manufacture of aluminum cans on a large commercial scale is now practicable as a result of the joint development effort of the Taiwan Fisheries Research Institute and the Taiwan Aluminum Corporation. Future efforts in fisheries development should be directed toward (a) promotion of export; (b) development of deep-sea fisheries; (c) mechanization and modernization of production facilities; (d) development of processing; and (e) development of shrimp culture.

At the present stage, a great deal of emphasis is being placed on the development of deep-sea tuna fishing, which undoubtedly warrants further encouragement in view of the increasing demand for frozen tuna in the world market and decreasing supply of this product by Japan. Our position as a tuna-producing country has now been considerably strengthened following the expansion of our tuna fleet with vessels constructed with

Taiwan (Contd.):

a World Bank loan and the success of the overseas base operation at American Samoa.



Fig. 2 - Type of modern tuna long-liner now used by Taiwan fishermen. This one was launched in 1965.

Shrimp fishing is also promising. The export as well as production of shrimp has steadily increased in recent years.

The development of large-stern trawler fishing has been a matter of discussion for many years; it has developed very quickly in Japan and other advanced countries, and seems to be a fairly profitable undertaking.



Fig. 3 - Tuna displayed for auction at Taiwan's Kaohsiung market.

Japan exports various kinds of fishery products besides frozen and canned tuna, including canned salmon, canned crab, pearls, etc.; it occurs to me that it may be timely for us to initiate studies on the feasibility of going into these various export fields.

Deep-sea fishing is beyond the capacity of family-type small operators. We have a few relatively large fishing companies, all newly established with World Bank and the Joint Commission on Rural Reconstruction (JCRR) financial assistance. These enterprises are still too small and too few to permit economies possible to large companies.

The motorization of fishing craft and wide use of synthetic lines and nets have been introduced with success in Taiwan. However, electronic equipment, including fish finders, is still not popular in Taiwan. For instance, only a few hundred out of upwards of 8,000 powered fishing boats are equipped with fish finders.

Little work has been done in mechanizing fishing operations.

The average annual catch per fisherman in Taiwan is only 2.4 metric tons, as compared with 64 tons in West Germany. This may be attributed to a number of factors; but inefficient fishing methods and equipment are by far the most important.



Fig. 4 - Purse-seine fishing was introduced in Taiwan only a few years ago. Bonito in net will be brailled out with scoop net (far right).

We should also report two important achievements in the field of fish culture. One is the success in the induced spawning of Chinese carp, the other is the phenomenal 200-300 percent increase in fish yield obtained by the application of chemical fertilizers in fresh-water fish ponds. Artificial spawning will save large amounts of foreign exchange spent annually for import of fish fry, while the increase in fish production in fresh-water ponds will permit fuller utilization of reservoir ponds.

The oyster growers in Australia enjoy a good income and live well. In contrast, the oysters grown in Taiwan are generally small and unsightly and our oyster farmers poor. A study should be made for improvement of oyster culture so that better harvest can be assured and the living standard of oyster farmers improved.

We frequently hear of complaints by foreign buyers about the quality of our fishery exports. I hope that such

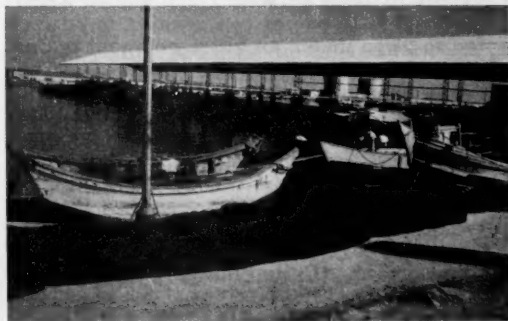


Fig. 5 - Fish market at Makung on Pescadores, Taiwan.

Taiwan (Contd.):

complaints will be kept to a minimum in the future. We must make our producers quality-minded and strengthen our export inspection system. The establishment of a system of self-inspection by the industry should be promoted.

We have up to now done very little for promotion of market news services. This work is extensively conducted by such countries as the United States and Japan, both of which have their own vast networks spreading all over the world. We have to keep close contact with and make effective use of these foreign fish market news services. However, we must have such services of our own some day.

International cooperation is another field to which we should attach great importance. In the last two years, we have sent a number of technicians to South Vietnam, Singapore, Sierra Leone, and Malta to help develop fisheries in those countries. We have made gifts of Chinese carp fry to South Vietnam and the Philippines. We also should seek technical cooperation with countries that are economically advanced but deficient in fish supply such as Australia.

TO BUY FISHING VESSELS:

The Government of the Republic of China plans to submit an application for a World Bank (IBRD) loan of US\$10.9 million. The loan would finance the construction and gear for 28 fishing vessels (of which 24 would be 150 gross tons and 4 only 15 gross tons). (United States Embassy, Taipei, April 9, 1966.)

**Republic of Togo****RECEIVES FISHING VESSEL FROM WEST GERMANY:**

A gift of a fishing vessel (the Berlin) was presented to Togo by West Germany on April 5, 1966. This is one of two vessels to be presented to Togo under an aid agreement of December 1963 between the two countries. The vessel is about 57 feet long, has a beam of about 18 feet, and a draft of about 6 feet. The Government of Togo with the aid of German specialists will use the two vessels for exploratory fishing and fishing gear improvement and development. The vessels will operate out of the new port in Lome being built by German contractors under a West German loan agreement. (United States Embassy, Lome, April 13, 1966.)

**Tunisia****FIVE FISHING VESSELS FROM EAST GERMANY:**

The last 5 of 10 fishing vessels ordered from East Germany arrived in Tunisia in March. The first 5 vessels were delivered in January. The vessels were obtained in exchange for Tunisian exports under a trade agreement with East Germany signed in August 1964.

The vessels (100 gross tons each) carry a crew of 15 and have a cold-storage capacity for 20 metric tons of fish. The vessels were built for operation in warm climates and can fish anywhere in the Mediterranean Sea. After the crews have gained experience, it is expected that the vessels will also fish in the Atlantic Ocean.

With these new vessels, the National Fisheries Office now has a fleet of about 50 relatively large and modern fishing vessels. The National Fisheries Office (Office National des Pêches) is a Government agency. (United States Embassy, Tunis, March 9, 1966, and previous reports.)

Note: See Commercial Fisheries Review, March 1966 p. 69, and June 1964 p. 58.

**U.S.S.R.****PACIFIC SCALLOP PRODUCTION AND EXPORTS TO U. S.:**

In mid-April 1966, the vessels of the DAL-MORPRODUKT (the Far Eastern Specialized Marine Products Administration) began to fish for scallops in the Pacific Ocean. The season will continue throughout the rest of the year (7-8 months) and a total of 3,000 metric tons of landings are planned. In addition, 6 Sakhalin kolkhoz (cooperative) seiners also began harvesting scallops near the Kuril Islands, but their catches were small. Editor's Note: In 1965, the U.S.S.R. exported almost 650,000 lbs. (about 300 metric tons) of Pacific scallops to the U. S. A New York fishery broker and importer imported the scallops under a 5-year exclusive contract concluded with the Soviet Union in early 1965. Soviet scallop fishermen operating close to Siberian shores were accused of destroying the scallop stocks and beds and were ordered to stop that fishery until the resource recovers. As a result, the U.S.S.R. offered only

U.S.S.R. (Contd.):

small quantities for export in 1966 and the U. S. importer decided against taking any.

FISH PRODUCTION COSTS:

Soviet economic studies show that one metric ton of fishery products can be produced in the U.S.S.R. with 25-30 percent less capital investment than the same quantity of meat products. Similarly, it costs 2-5 times as much to produce one ton of cattle (slaughter weight) as compared to one ton of fish (landed weight). (Rybnoe Khoziaistvo, March 1966.)

Note: See Commercial Fisheries Review May 1965 p. 77.

EXPANSION OF PACIFIC FISHERIES:

By 1970, the Soviet Union plans to catch 3.2 million metric tons of fish, shellfish, and other aquatic products from the Pacific and Indian Oceans (including the catches of Far Eastern whaling flotilla in the Antarctic). The new plan, incorporated into the Draft of the 5-Year Plan, was submitted to the 23rd Congress of the Soviet Communist Party, which met in Moscow in March-April 1966. Ratified by the Congress automatically, the Plan has the force of any other Soviet Government regulation and is considered almost a law.

In 1965, the vessels of the Far Eastern Fisheries Administration (which directs Soviet fishing in Pacific and Indian Oceans) produced 1,970,000 metric tons of fishery landings. During the next 5 years, the yearly rate of increase will have to amount to about 240,000 tons of fishery landings to give a total catch of 3.2 million tons in 1970.

To obtain such large yearly increases, the Soviets intend to: (a) increase the exploitation of all available fishery resources of the North Pacific. Particular attention will be paid to deep-water trawling for halibut and sablefish. Another resource which will be exploited are the saury stocks off Aleutian Islands and off British Columbia. Since saury are now mostly caught in the nearby Sea of Japan by seiners, whose range is limited, new large saury-processing factoryships will be acquired. (b) expand into new, hitherto little exploited fishing areas in the South Pacific and Indian Oceans. One of the major

targets in the equatorial parts of this area are "the enormous tuna resources." An increase in the Far Eastern tuna fleet is foreseen. Another promising area is the New Zealand Plateau and the Great Australian Bight where large red snapper schools were discovered early in 1966 by two Soviet fishery research expeditions.

PACIFIC OCEAN PERCH CATCH BY LARGE STERN FACTORY TRAWLER:

Soviet catches off United States and Canadian Pacific coasts are reported in the Kamchatskaia Pravda issue of April 12, 1966.

The article described the homecoming of the large stern factory trawler Itelmen (BMRT 399). Constructed in 1965, the 3,200-gross-ton trawler left her home port of Petropavlovsk Kamchatskii (on the tip of the Kamchatka Peninsula) in December 1965. Most of her fishing was done off British Columbia (Queen Charlotte Islands). During 3 months of fishing, the Itelmen caught 4,082 metric tons (about 9 million pounds) of ocean perch and produced 2,170 tons of frozen products (packed in cases of 35 kg. or 77 pounds each), 370 tons of fish meal, and 16 tons of oil. The average catch per crew member during the 3 months was almost 200 tons (440,000 pounds).

Upon its arrival at Petropavlovsk on April 9, the Itelmen crew was received by the Secretary of the City Committee of the Communist Party, representatives of the Trade Unions, and by officials of the Kamchatka Regional Fisheries Administration. Being the top producer among the about 30-40 Soviet large factory stern trawlers in the Pacific, the crew of the Itelmen received a number of awards. One of the awards indicates that most of the Itelmen crew consists of members of "communist youth" probably in the age range of 18-25. All the honors and recognition were in addition to a handsome bonus paid to the fishermen for producing above the planned amounts.

The first quarterly plan for 1966 of the Itelmen provided for a catch of about 2,500-3,000 metric tons. Its 1966 official yearly catch plan of 10,980 metric tons was upped by the crew to 11,500 tons.

The Itelmen was scheduled to go to the Petropavlovsk shipyards for maintenance and

U.S.S.R. (Contd.):

repairs, which normally take a month to finish. But the enterprising crew of the Itelmen decided to work in the shipyard when on shore leave and to shorten the repair time to about 2-3 weeks.

Editor's Note: Although the Itelmen was the highest producer among the Soviet large stern factory trawlers (BMRT's) during January-March 1966, similar and even larger catches are not unusual among the Soviet Far East stern trawlers. In 1964, one of them landed 15,000 metric tons of fish (mostly ocean perch) and yearly catches of 10,000 metric tons are not uncommon.

OCEAN PERCH FISHERY
OFF PRIBILOF ISLANDS:

In 1960, the Soviet fishing fleets began summer fishing for Pacific ocean perch near the Pribilof Islands after the herring season was over and caught about 7,000 metric tons. But in 1961 with the beginning of the highly successful Gulf of Alaska ocean perch fishing, the Pribilof area received no further attention. This year, however, Soviet Far Eastern fishery administrators began to make plans to begin anew the ocean perch fishery near the Pribilofs.

An additional resource of Pacific ocean perch discovered in 1965 is being fished by the Soviets in the vicinity of the Commander Islands; medium fishing trawlers are reportedly catching 2.5 metric tons of fish per drag.

SHRIMP CATCH IN THE GULF OF ALASKA:

In the first 3 months of 1966, the Soviet shrimp fishing fleet (15 medium freezer trawlers of the type SRTM-Maiak) caught about 4,000 metric tons (8.4 million pounds) of shrimp south of the Aleutians near the Shumagin Islands. If the Soviet vessels were fishing for shrimp every day of their stay in the area (a total of about 1,300 vessel days), then their average catch would amount to almost 3 tons a day. Assuming that some fishing time was lost due to bad weather and other causes, their average daily catch was probably considerably higher.

Soviet shrimp operations in the Far East are directed by a special administrative unit

called DALMORPRODUKT (Far Eastern Specialized Marine Products Administration) whose main task is to develop fisheries for export products (shrimp, squid, scallops, mussels, seaweeds, etc.).

SEALING OPERATIONS BEGIN IN PACIFIC:

Early in April 1966, the Far Eastern sealing fleet sailed from its home port at Vladivostok for 8 months of operations in the Bering Sea and the Sea of Okhotsk. In addition to bearded seals, the Soviets will also harvest sea lions, ringed seals, and other pinnipeds not protected by the International Fur Seal Convention.

WHALING BEGINS IN THE NORTH PACIFIC:

The Sovetskaya Rossiia, which finished her Antarctic whaling operations by mid-April 1966, will continue whaling in the North Pacific for a few months before returning to her home port of Vladivostok. At the same time, other Soviet whalers left the Far Eastern ports to begin their operations off the Kuril Islands and (normally by mid-May) off the Aleutian Islands. Editor's Note: Not all the whale catch will be used for domestic production. As in previous years, part of the whale meat will be exported to Japan (5,000 metric tons in 1966); this year, also, for the first time, the Soviets will export to Japan 150 metric tons of whale hearts, fins, and periteneas.

EXPANSION OF FISHING FLEET:

The Soviet Union plans to add 1,500 small and large vessels to her fishing fleet during the 5-Year Plan 1966-1970. Most of them will be constructed in domestic shipyards but foreign purchases, especially from Eastern Europe, will also be numerous.

The additions will consist of 13 different classes. Among the larger types of vessels the following planned additions are known: 150 large stern freezer trawlers (Maiakovskii class from the U.S.S.R. and Kosmos class from Poland); 100 large tropical stern trawlers (Atlantik class from East Germany); a 40,000-gross-ton giant fishing mothership (Vostok class, now being built at Leningrad); 145 refrigerated fish carriers (many purchased in Western Europe); an undetermined

U.S.S.R. (Contd.):

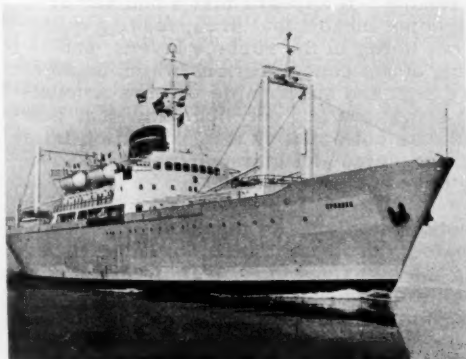
number of floating fish factories (Soviet, West German, Swedish, and Japanese construction); and others. Soviets admit that "there is not enough room" on existing fishing grounds for all of these vessels. The only way to successfully use the new additions is for them "to conquer new, unexploited fishing grounds." Most of these would be in the South Atlantic, South Pacific, and in the Indian Ocean.

ADDITIONS TO PACIFIC FLEET:

The Nikolaev Shipyards (on the Black Sea) have begun the construction of 12 large factory stern trawlers of the Maiakovskii class (3,200 gross tons) for the Far Eastern Fisheries Administrations. The first trawler, the Valentin Kotelnikov, was delivered in mid-April 1966 and is on its way to the Pacific where it will be added to the Sakhalin fishing fleet. Editor's Note: In early 1966, the U.S.S.R. operated about 35 large stern factory trawlers in the Pacific and Indian Oceans; all were based in Soviet Far Eastern ports.

FREEZER-TRAWLER "PRILUKI"
DELIVERED TO SOVIETS
BY DANISH SHIPYARD:

The freezer-trawler M/S Priluki was delivered to V/O Sudoimport, Moscow, by a Copenhagen shipyard March 21, 1966. The vessel is part of a series of freezer trawlers for the U.S.S.R. being built by the Danish shipyard to the following specifications:



The freezer-ship M/S Priluki which can also be used as a stern trawler.

length between perpendiculars 91 meters (298.5 feet), breadth 16 meters (52.5 feet), and deadweight tonnage 2,500 to 2,600 metric tons. The first vessel in the series was the M/S Skryplev launched May 10, 1962.

The Priluki can operate as a stern trawler, but it is designed primarily to operate as a freezer-ship, receiving catches from other trawlers. The vessel is equipped with butchering lines to head and gut fish and airblast freezers for freezing dressed fish in blocks in metal pans. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 30, 1966.)

(Editor's Note: The Priluki was reported to have joined the Soviet fleet in the Northwest Atlantic.)

Note: See Commercial Fisheries Review, February 1966 p. 83.

EXPERIMENTAL CATAMARAN TRAWLER:

A Soviet shipyard in Kaliningrad is said to be building an experimental vessel made up of the hulls of two trawlers linked by a common deck. Plans call for this vessel to be tested in the Atlantic in 1966. The Soviets believe this catamaran vessel will make possible the use of very long sweep nets which will be fished from the stern. The catamaran is expected to catch twice as much fish as an average trawler.

Soviet specialists also plan to use the vessel to conduct studies on the efficiency of twin-hull fishing vessels. (Fishing News, London, April 1, 1966.)

NORTHWEST ATLANTIC
FISHERY RESEARCH:

After an 11,000-mile three-month cruise in the North Atlantic, the research vessel Sevastopol returned to Murmansk on March 10, 1966. Most of the biological studies were done off Greenland's western and eastern coasts (in the Davis and Denmark Straits), in the Sea of Labrador, and on the Grand Banks. In the Sea of Labrador, large schools of cod were discovered. By measuring water temperatures at various depths and at the bottom and comparing them to previous measurements, Soviet scientists determined that the Labrador Sea is becoming warmer. This to them indicates a future increase of cod resources in the Sea of Labrador. Ex-

U.S.S.R. (Contd.):

periments with deep-water trawling were also made.

FISHERY AND OCEANOGRAPHIC STUDIES OF THE PACIFIC OCEAN:

The Pacific Science Association (Honolulu, Hawaii) was advised by the U.S.S.R. Academy of Sciences that the representative institution for the Association in the U.S.S.R. is the Academy. In July 1965, the Association was advised by the Presidium of the Academy that a Soviet National Committee had been created for the Association. That Committee requested the well-known Soviet scientist P. A. Moiseev, Deputy Director of the Soviet Federal Scientific Research Institute for Marine Fisheries and Oceanography (VNIRO), to prepare a short survey of Soviet fisheries and oceanographic research in the Pacific. This survey was published in the Information Bulletin of the Pacific Science Association (vol. 18, nos. 1 and 2, February - April 1966). Excerpts from the report follow:

The basin of the Pacific Ocean is characterized by varied flora and fauna. The vast area stretching from the Arctic to the Antarctic, the wide range of depths, some thousands of islands dispersed both in the boreal and in the tropical areas, the powerfully flowing permanent currents (principally the Kuroshio and the Humboldt Currents), the historical characteristics of the formation and settling of the aquatic fauna--all these characteristics of the Pacific Ocean make it extremely productive from the biological point of view.

Despite relatively little knowledge of the Pacific Ocean (considerably less than of the Atlantic Ocean), about 30 million metric tons of aquatic organisms, more than half of the world catch, are now caught in the Pacific Ocean. Certainly that level of catch taken by the fishery cannot be a limit, and after sufficiently thorough study of the resources of the Ocean, and with rational fishery (by taking measures aimed at the increase of biological productivity), the potential resources of the Ocean may ensure much higher catches of aquatic species. It is enough to recall the extremely rapid growth of catches taken by Peru (up to 9 million tons) and by the U.S.S.R. (up to 2 million tons), the sustainable high level of catch taken by Japan (6.5 million

tons), as well as catches taken by other countries to understand the great possibilities in the development of fisheries in the Pacific Ocean.

Taking into account the rapid growth of the population of Siberia and of the Soviet Far East, the U.S.S.R. fisheries investigations in recent years aimed at finding and studying fishery resources, mainly in those areas which are so far insufficiently investigated.

Twenty exploratory and research vessels (displacement from 400 to 4,000 tons) belonging to TINRO participated in the expeditionary work, in addition to some 15 vessels which were used for conducting research work. In addition, large amounts of biological and statistical materials were collected by various commercial vessels operating in different areas of the Pacific Ocean.

The northeast part of the Pacific Ocean, in contrast to earlier existing ideas, should be considered an extremely productive area of the World Ocean, which can ensure a catch of some million tons of aquatic species and, principally, of flatfish, Pacific ocean perch, herring, pollock, grenadier, shrimp, and others. This high productivity is assured by biogenic elements brought to the surface layers as a result of upwelling in the area of the Continental Slope (bathyal), which is clearly observed in the north part of the Pacific Ocean.

Fishery investigations in the north Pacific Ocean covered not only traditional depths usually fished by the fishing fleet, but were also conducted in relatively deep waters from 350 to 1,000 meters (1,148 to 3,281 feet) with good results. It appears that a number of fish species inhabit that area, feeding on organisms living in the surface layers, and forming dense concentrations which could ensure high and sustainable catches amounting to some tons per one-hour trawling. Scientific data collected by this expedition is being completed and four volumes have already been published.

Another vast area of the Pacific Ocean investigated thoroughly by the Soviet scientists during the last five years is its western part. Special attention was given to investigations of distribution, migration, and stock condition of saury near the east coast of Japan, in waters near the Kuril Islands, and in the area of drift in the Pacific Ocean. The results of investigations showed that saury stocks were

U.S.S.R. (Contd.):

large although at present Soviet and Japanese fishermen take only a small part of those stocks.

Studies on the biology of the Pacific salmon, and especially of the reasons for fluctuation in their abundance, were made in coordination with Japanese scientists. Soviet ichthyologists and oceanographers organized fishery research in the Seas of Japan and China, some of it carried out with North Korean and North Vietnamese scientists. The results of those investigations were published in different Soviet, Vietnamese, and Korean editions.

Soviet research vessels recently began operations in the vast tropical areas of the Pacific Ocean and the eastern part of the Indian Ocean with the purpose of finding oceanological characteristics of the fishing areas and providing a scientific basis for the development of tuna, dogfish, sailfish, and other pelagic fisheries. In addition, fishery investigations were carried out in some other areas of the southern part of the Pacific Ocean.

A number of specialized investigations of the biology of whales, fur seals, seals, commercial invertebrates, and algae were also made in various parts of the Pacific Ocean. Many of them (investigations of whales and fur seals) are based on programs coordinated with scientists of other countries, and the results are regularly presented to the International Commissions.

Soviet scientists assume that the Pacific Ocean area could ensure a much higher level of sustainable catch than it does now, provided that there is a thorough study based on scientific data and collaboration with other countries concerned in the utilization of water resources and in rational and effective fishery.

RESEARCH IN THE INDIAN OCEAN:

The fisheries and oceanography research vessel Mikhail Lomonosov (6,000 displacement tons) is scheduled to leave late in April 1966 for a cruise in the Indian Ocean. On previous trips, the vessel participated in the First Joint Cuban-Soviet Fishery and Oceanography Research Expedition in the Gulf of Mexico and the Caribbean Sea (1964-1965),

collaborated in the mapping of a Pacific Ocean relief map, and during September 1965-January 1966, studied the formation of radioactive fields in the Northeastern Atlantic.

STUDY OF FISH REACTION TO SOUND:

The Soviet fishery research vessel Tunets of the Polar Scientific Research Institute of Marine Fisheries and Oceanography (PINRO) spent a month and a half in the Bering Sea studying the reaction of fish to sound. Soviet scientists carried out hundreds of experiments using hydro-acoustic equipment and various frequencies and intensities of sound. The preliminary report claims that certain frequencies make fish gather into dense schools where they can be conveniently fished.

FISHERIES MINISTER TO VISIT JAPAN:

Soviet Fisheries Minister Ishkov was scheduled to visit Japan in May 1966 at the invitation of Japanese Minister of Agriculture Sakata to discuss technical cooperation in fisheries between both countries and the operations of Japanese fishermen around Shikotan Island and the Habomai Islands. The Habomai Islands and Shikotan, off Hokkaido's eastern tip, were occupied by Soviet forces at the close of World War II. The islands have been retained by the U.S.S.R. which claims jurisdiction over them until the signing of a peace treaty with Japan. The area is a traditional fishing ground for Japanese fishermen who have often been arrested by the Soviets for violating "Soviet territorial waters."

The first move for a Japanese-Soviet understanding of the thorny problem of the Japanese fishermen's operations in the southern Kurils was made during the 1965 visit of the then Japanese Minister of Agriculture Akagi to Moscow. Akagi was also received by Premier Kosygin and made a strong presentation of Japan's case. The Joint Communique issued after Akagi's visit mentioned this problem and included a Soviet promise to study it.

PATROL VESSELS ORDER JAPANESE TRAWLERS FROM FISHING AREA:

Japanese trawlers operating in the Sea of Japan about 18 miles off the coast of the Soviet Maritime Region (Primorskii Krai) of

U.S.S.R. (Contd.):

Siberia were ordered by a U.S.S.R. patrol vessel to leave the area. The incident, which occurred on March 14, 1966, and involved 16 Japanese trawlers, was reported to be the third such action by the Soviets in 1966. According to reports from Otaru City on the west coast of Hokkaido, the home port of the Japanese trawlers, previous similar incidents occurred on January 26 involving 6 vessels and February 15 involving 16 vessels. No such incidents took place in 1965.

As described by the captain of one of the fishing vessels, the Soviet patrol vessel first ordered the trawlers to move 15 miles to the east. The 16 trawlers moved as ordered but later that afternoon 3 Soviet patrol vessels ordered the Japanese to "leave the place." In addition to patrol vessels, a Soviet aircraft was also seen in the vicinity. It is reported that Japanese fishermen were protesting Soviet action which might adversely affect their livelihood. (*Sankei*, March 15, 1966.)



United Arab Republic

SOVIET FISH LANDINGS DROP OFF:

Sales of Soviet-delivered fish have fallen off from 30 metric tons a day to one-half ton a day during the past few years. Cold-storage stocks are reported as large and excessive. The reason for decreased sales is consumer resistance and possibly the refusal by fish brokers to handle Soviet products. (*Al-Jumhuriyya*, Cairo, September 26, 1965.)



United Kingdom

FISHERY LOAN INTEREST RATES REVISED:

The British White Fish Authority announced that their rates of interest on loans made as from April 2, 1966, would be as follows:

For fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than 5 years, $7\frac{1}{2}$ percent (increase $\frac{3}{8}$ percent); on loans for more than 5 years but not more than 10 years, $7\frac{3}{8}$ percent (increase $\frac{3}{8}$ percent); on loans for more

than 10 years but not more than 15 years, $7\frac{1}{2}$ percent (increase $\frac{1}{2}$ percent); on loans for more than 15 years but not more than 20 years, $7\frac{3}{4}$ percent (increase $\frac{3}{8}$ percent).

The rate to processing plants for loans of not more than 20 years is unchanged at $7\frac{1}{2}$ percent.

The rates on loans made before April 2, 1966, are unchanged. (*The Fishing News*, London, April 7, 1966.)

Note: See *Commercial Fisheries Review*, January 1966 p. 98.

SOVIET FROZEN HERRING QUALITY DISPUTE:

Trouble broke out at Aberdeen in March 1966 over a cargo of frozen herring brought by the Soviet vessel *Sayani*. The consignment was 150 metric tons.

After about 70 tons had been discharged, Aberdeen processors decided to return their consignments. The frozen herring were about to be reloaded, when the mate of the *Sayani* closed the hatches, refusing to let the herring back on board.

One of the Aberdeen processors said that the herring were of a different quality from the first consignment which had arrived towards the end of 1965. "The sizes of the *Sayani*'s herring were mixed, from large downwards. They were packed differently and were more difficult to defrost. We had several tons ashore and sent them back," the processor pointed out.

Finally the processors who rejected the herring agreed to accept them.

Before going to Aberdeen the *Sayani* landed 350 tons of frozen herring at Yarmouth. (*Fish Trades Gazette*, March 19, 1966.)

LARGE FREEZER-TRAWLER "CASSIO" LAUNCHED:

The freezer-trawler *Cassio* was launched at Glasgow, April 5, 1966. The vessel is the 4th in a series of 7 large freezer-trawlers being built for a British firm. The *Cassio* has a storage capacity for over 500 tons of frozen fish. The vessel is designed to stay at sea up to 58 days and can operate in both northern and tropical waters. Specifications of the vessel are: length overall 224 feet,

United Kingdom (Contd.):

length between perpendiculars 194 $\frac{3}{4}$ feet, breadth moulded 39 feet, depth moulded to upper deck 25 feet, depth moulded to main deck 17 $\frac{1}{2}$ feet, speed in service 13 $\frac{1}{2}$ knots, main diesel engine 2,350 horsepower, cold-storage capacity 27,000 cubic feet, and crew accommodations for 51. The vessel is equipped with a controllable pitch propeller. Main machinery space is at the afterend, enabling the cold-storage rooms to be placed amidships.

SUPPLY SITUATION FOR FROZEN PROCESSED GROUND FISH PRODUCTS, JULY-SEPTEMBER 1964-1965:

British stocks of frozen processed groundfish totaled 24,101 long tons on September 30, 1965, an increase of 36 percent over stocks

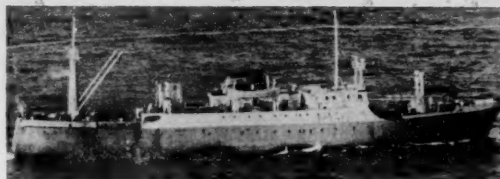


Fig. 1 - Large factory stern trawler, one of several Soviet vessels fishing in the Northwest Atlantic.

ly estimates to mid-April showed that about 75 Soviet vessels were operating off southern New England. By month's end, the fleet had increased to more than 100 vessels. The increase was due to the recent arrival of about 25 medium side trawlers (mainly from the Kaliningrad Fisheries Administration).

A total of 128 vessels (exclusive of duplication) were sighted during April and identi-

British Supply Situation for Frozen Processed Groundfish Products, July-September 1964-65

	1965			1964		
	Institutional Pack	Consumer Pack	Total	Institutional Pack	Consumer Pack	Total
	(Long Tons)					
Opening Stocks, July 1	15,104	8,332	23,436	10,882	10,077	20,959
Production, July-September	8,579	7,042	15,621	8,628	4,960	13,588
Imports, July-September:						
Denmark	1,321	1,135	2,456	969	1,963	2,932
Iceland	1,985	65	2,050	1,026	-	1,026
Norway	2,283	921	3,204	1,290	44	1,334
Netherlands	86	-	86	65	-	65
South Africa Republic	135	68	203	48	43	91
Japan	36	-	36	50	-	50
Canada	306	-	306	209	-	209
Germany	129	-	129	208	-	208
United States	6	-	6	3	-	3
Greenland	628	-	628	1	-	1
Faroe Islands	150	-	150	-	-	-
Other Countries	27	-	27	27	-	27
Total imports	7,092	2,189	9,281	3,896	2,050	5,946
Sales, July-September:						
Home market	10,774	9,729	20,503	10,916	8,535	19,451
Govt. estab. abroad	151	4	155	248	-	248
Ship's stores	157	-	157	192	-	192
Exports	2,009	1,413	3,422	1,929	903	2,832
Total sales	13,091	11,146	24,237	13,285	9,438	22,723
Stocks, September 30	17,684	6,417	24,101	10,121	7,649	17,770

on hand a year earlier. (British White Fish Authority.)



Foreign Fishing Off U. S. Coasts 1/

APRIL 1966:

Northwest Atlantic: U.S.S.R.: Soviet fishing in the Northwest Atlantic off the United States coast increased throughout April. Week-

1/Based on information from surveillance flights by U. S. Bureau of Commercial Fisheries management agents with U. S. Coast Guard cooperation, plus information obtained from other sources.

fied as 56 large factory stern trawlers, 10 large freezer factory trawlers, 24 large side trawlers, 28 medium side trawlers, 4 refrigerated fish transports, 3 factory base ships, and 3 fuel and water carriers. This compares to 107 vessels sighted during March 1966 and 107 during April 1965.

Soviet fleets, operating generally in large groups, were dispersed along 200 miles of the 100-fathom curve of the Continental Shelf from Cape Hatteras to south and southeast of Cape Cod.



Fig. 2 - Aerial view of Soviet refrigerated transport vessel with factory stern trawler alongside in Northwest Atlantic.

The principal species of fish--whiting and red hake--caught by the Soviets remained unchanged for the past two months. But it appears that the Soviets are not putting as much emphasis on red hake as they did a year earlier but have concentrated primarily on catching whiting. The fact that many large factory stern trawlers had their reducing plants operating indicates that a portion of the catch is being reduced to fish meal.

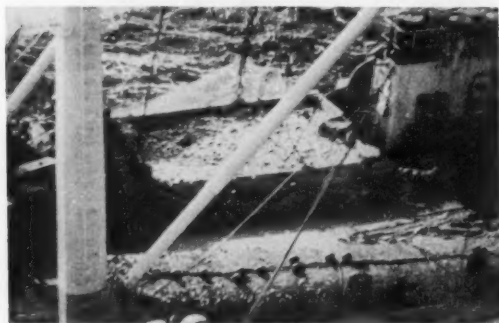


Fig. 3 - Deck view of Soviet stern trawler in North Atlantic--mostly red hake and whiting (silver hake).

Only a few Soviet vessels fished on Georges Bank in April. This in all probability is attributed to the abundance of fish off southern New England and the Middle Atlantic coast.

SPAIN: In the first week of April, 24 Spanish vessels operating as "pair trawlers" were located in southeast Georges Bank. Heavy to moderate catches of fish observed on the decks of those vessels were primarily

large cod and haddock. The fishing gear in use appeared to be the proper mesh size. Crewmen on deck were beheading and splitting the fish prior to salting. No information is available on the location or operations of the Spanish fleet for the balance of the month.

CANADA: An estimated 30-35 Canadian fishing vessels fished for haddock in the Northeast Peak of Georges Bank in the first week of April (not far from the Spanish vessels). Because large concentrations of other foreign fishing vessels south of that area required increasing surveillance, no observations were made on Canadian fishing activities for the balance of April.

Off Mid-Atlantic Coasts: U.S.S.R.: Foreign vessel surveillance flights off the Middle Atlantic coast were drastically reduced due to poor weather conditions. Only 6 Soviet large factory stern trawlers were sighted and identified 65 miles east of Cape Henry, Va. They were fishing at depths of 50 to 75 fathoms. Heavy catches of fish on deck appeared to be primarily scup (porgies). Several hauls were observed with estimated catches of between 25,000 and 30,000 pounds of fish per haul. Dehydration plants were in operation on all vessels.

Although surveillance flights allowed only limited coverage, it is estimated that about 50 Soviet vessels fished intermittently along the mid-Atlantic coast during April.

In the Gulf of Mexico and Caribbean: NORWAY: Since leaving Norway in June 1965, a Norwegian shark fleet of four vessels (each equipped with radar, depth-recorder, and direction finder) has been fishing off the eastern and southeastern coasts of the United States in the Atlantic Ocean, the Gulf of Mexico, and the Caribbean Sea. In early 1966, the fleet sailed down the Central American coast to Trinidad, and then to Charleston, S. C., where supplies were taken on in March and April. The fleet's total catch (mainly brown and mackerel sharks with small quantities of dolphin and swordfish) probably did not exceed 450 tons after about 10 months of fishing. Long lines from 20 to 35 miles in length and equipped with radar buoys are reported to be the gear used. The catch is frozen for further processing in Norway or Germany. Italy is the intended market.

U.S.S.R.: No precise information on Soviet fishing in the Gulf of Mexico and Carib-

bean is available although Soviet sources report a recent increase in the number of vessels operating out of Cuba's newly-constructed fishing port at Havana.

Northeast Pacific: U.S.S.R.: In the first week of April, a part of the Soviet fishing fleet operating off British Columbia moved south into the Pacific ocean perch fishery off the Oregon coast. Since the fleet was widely dispersed, the same vessels were sighted in several locations. This led to exaggerated reports on the size of this fleet ("over 200 fishing vessels") in the local and national press.



Fig. 4 - In North Pacific, Soviet trawler transferring Pacific ocean perch to reefer vessel.

The total number of Soviet fishing vessels off Oregon during the first three weeks of April never exceeded 30 units. About 25 were medium fishing vessels of various types; the rest were processing vessels (refrigerators and base ships), tankers, and one research vessel. Up to two large stern factory trawlers were also sighted.

In the fourth week of April an important change took place with the arrival of 6 additional large stern trawlers from the disbanding flounder fishery in Bristol Bay. It is believed that the trend to employ more large stern factory trawlers (among the most efficient Soviet fishing vessels) will continue as long as fishing remains good.

As of April 29, the fleet totaled 37 vessels as compared to 26 vessels on April 2. Of the 37 vessels, 29 were fishing vessels--7 large stern factory trawlers and the balance medium trawlers with or without refrigeration and freezing equipment. The rest of the fleet included 4 large refrigerator transports and base ships (from 3,300 to 5,500 gross tons), 2 support vessels, 2 research vessels.

U. S. Bureau of Commercial Fisheries field agents estimated that the fleet was catching about 1.2 to 1.9 million pounds of fish a day. They believe that the Soviets in about 2 to 3 months will catch about 80 million pounds of

fish. However, the Bureau's Foreign Fisheries Specialists in Washington (who have access to Soviet data on average catches for vessels of the type fishing off the Pacific Northwest) estimate that the Soviets are catching somewhat less than 1.0 million pounds of fish a day.

The Soviet fleet, whose vessels at the beginning of April were scattered from Vancouver Island to Coos Bay (Oregon), was concentrated by mid-April on the Continental Shelf about 15-35 miles from Yaquina Head (Oregon). Trawling mostly in waters deeper than 100 fathoms, they were catching mainly Pacific ocean perch and some other rockfish species.

Ocean perch caught aboard the medium fishing trawlers without refrigeration (SRTs) are chilled and transhipped as soon as possible aboard modern refrigerator and processing vessels to be quick-frozen and transported to Siberian home ports. Medium fishing trawlers with refrigeration (SRTs) or freezing equipment (SRTMs) handle perch landings immediately but unload them eventually to refrigerated fish carriers. This enables those vessels as well as the SRTs to remain on fishing grounds for months at a time. Large stern factory trawlers freeze ocean perch themselves and either unload it (packaged in cartons) aboard refrigerated transports or take it to Soviet ports themselves, depending on the amount of time they have already spent at sea, mechanical condition of the vessels, and the cruise plan for the stern trawler.

Though most ocean perch are frozen, there is in the Soviet Far Eastern Fisheries underway a drive to begin large-scale production of ocean perch fillets. There is little doubt that perch fillets are in great demand in the Soviet Union.

The Soviets fished in strength off the Pacific Northwest twice before. In April 1965, a group of about 15 fishing vessels detached themselves from the Gulf of Alaska fleet and began fishing 50-150 miles west of Cape Flattery (off northern Washington State). After about 10 days of fishing they returned to the Gulf of Alaska. In mid-June 1965, a small Soviet fleet, accompanied by a research vessel and a refrigerated fish transport, again began fishing about 30-60 miles off Cape Flattery, and moved south to the waters off northern Oregon. But they soon departed for Alaskan fishing grounds.

The 1966 "expeditionary" pattern of the Soviet fleets, however, indicates that this time they intend to stay as long as fishing is good. A commander of the fleet aboard the base ship Churkin directs all fishing and processing operations. Fishing vessels are supported by refrigerated transports, tankers, fuel and water carriers, and research vessels. This allows the fleet to operate as an independent unit, which was not the case in 1965.

The real reason behind the 1966 Soviet move south off Oregon may be the fact that the Soviet Far Eastern Fisheries Administration was unable to fulfill the production quota for the first quarter of 1966. One way to increase the production is to tap unexploited and little exploited fishery stocks.

Alaska: JAPAN: At the end of April about 82 Japanese fishing vessels were operating off Alaska.

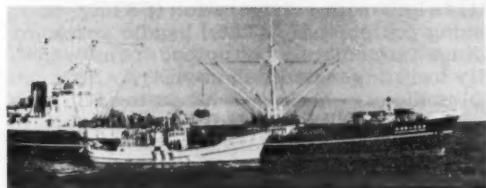


Fig. 5 - Japanese refrigerated fish transport and supply vessel supplying a wooden trawler with new nets in Gulf of Alaska. Typical high-seas support operations.

Only 1 fish meal and oil fleet remained in the Eastern Bering Sea by month's end. This fleet (composed of a factoryship and 30 trawlers) fished the Bristol Bay flat north of Unimak Island. Of the other fleet in this fishery, one returned to Japan and the second shifted to the shrimp fishery.



Fig. 6 - Japanese fish factoryship in Gulf of Alaska.

Of the 11 factory trawlers licensed by the Japanese to fish in the Gulf of Alaska this year, 2 began operations southwest of Kodiak Island in late April. The first trawler which arrived was boarded by a U. S. Bureau of Commercial Fisheries biologist observer as

part of the International North Pacific Fisheries Commission (INPEC) program to determine the effects of extensive trawling (primarily for ocean perch) upon Gulf of Alaska stocks of halibut and king crab.

Two other factory trawlers operated along the central Aleutians presumably for ocean perch during most of April.

Waters 100 to 200 fathoms in depth along the Continental Shelf edge northwest of Unimak Pass were fished by two additional Japanese factory trawlers in April. Observations and boarding indicated Alaska pollock comprised the vast bulk of the catches in that area.



Fig. 7 - Washing silt and dirt from trawl-caught fish on the main deck of a typical Japanese factoryship fishing off Alaska.

In early April, a factoryship with 11 trawlers moved from the pollock and flounder fishing ground near Unimak Pass to the usual shrimp-fishing region near the Pribilof Islands. This fleet was joined at the end of the month by a second factoryship with 13 accompanying trawlers.



Fig. 8 - Japanese stem-ramp trawler typifying the modern self-sufficient vessels catching and processing shrimp and Pacific perch in the eastern Bering Sea.

The Japanese king crab fishery in the Eastern Bering Sea reached full strength in

mid-April when the second factoryship joined her predecessor on the outer Bristol Bay ground. The factoryships, each of which is accompanied by five tangle net-handling trawlers, fished north of Port Moller in the same region as their Soviet counterparts.

U.S.S.R.: The total number of Soviet fishing and support vessels off Alaska decreased considerably during April from about 200 reported in March 1966 to about 160. This total number is somewhat smaller than it was last year at the same time.



Fig. 9 - Type of Soviet small trawler fishing in the eastern Bering Sea.

The transfer of vessels to the fishery off the Pacific Northwest reduced the size of the Gulf of Alaska Pacific ocean perch trawling fleet to about 70 vessels in mid-April. By month's end the Gulf fleet operating from Yakutat to Portlock Banks was again built up to about 100 vessels apparently by transfers from the disbanding Bristol Bay flounder fleet.



Fig. 10 - Zakharov-class factoryship operating in the king crab fishery of the eastern Bering Sea. In the shadow of the vessel is an SRT trawler. Factoryship carries 12 motorboats for king crab fishing - one is near the bow and another near the stern.

The Soviet shrimp fleet in the Gulf of Alaska consisted of 12 medium freezer trawlers (SRTMs) operating on the shrimp grounds near Shumagin Islands. The fleet was supported by one refrigerated carrier.

The flounder fleet in the outer Bristol Bay flats was being disbanded. Some of the participating vessels were transferred to the ocean perch fishing fleets, while others joined fisheries off Kamchatka. With the transfers to the Central Gulf of Alaska perch fleet, it is estimated that the remaining flounder fleet consists of 20 to 30 vessels.

In early April three Zakharov-class factoryships accompanied by about 11 tangle net-handling trawlers entered the king crab fishery in the Eastern Bering Sea (Bristol Bay). Throughout the month the vessels concentrated on the traditional crab-fishing grounds north of Port Moller (mid-Alaska Peninsula).

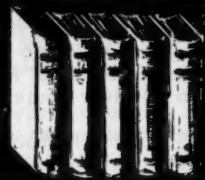


STURGEON IS THE LARGEST FRESH-WATER FISH

The giant sturgeon (*Huso huso*), inhabitant of the Volga River, and other large rivers emptying into the Black Sea, is the largest fresh-water fish species in the world. The largest known was 14 feet 2 inches, weighing 2,250 pounds. (Conservation Notes, Iowa State Conservation Commission, March 28, 1966.)



FEDERAL ACTIONS



Department of the Interior

COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT

FEDERAL AID FOR FISHERY PROJECTS:

Following is a listing of the approved projects under the Commercial Fisheries Re-

search and Development Act (Public Law 88-309), which is administered by the Bureau of Commercial Fisheries, U. S. Department of the Interior. The list includes those projects approved from January 1, 1966, through April 1, 1966. Subsequent listings will be published at the end of each quarter.

APPROVED PROJECT PROPOSALS Section 4(a) - Public Law 88-309

State	Project	Title	Total First Year Cost	Date Approved
Alabama	2-29-C	Construction of Public Oyster Landing Facilities	\$ 9,000	2/16/66
Alabama	2-18-R	Oyster Pond and Raft Production	30,000	3/15/66
Alabama	2-31-C	Oyster Rearing Pond Construction	8,000	3/16/66
Alabama	2-30-D	Shell Planting for Oyster Cultch	42,000	2/28/66
Alabama	2-34-R	Cooperative Gulf of Mexico Estuarine Inventory - Alabama	43,333	4/1/66
Alaska	5-12-C	King Salmon Headquarters - Architectural Plans	30,000	3/31/66
California	6-5-S	Coordination of Public Law 88-309 in California	26,532	2/23/66
Colorado	6-2-D	Raising Bait Fishes in the Rocky Mountain States	32,000	2/28/66
Connecticut	3-33-S	Coordination	3,800	2/4/66
Connecticut	3-44-R	Investigations on the Lobster	17,142	3/8/66
Connecticut	3-45-R	Investigation of the Life Histories and Potential Fishery of River Herrings in Connecticut	17,142	3/11/66
Florida	2-17-R	A Study of Reproduction in Some Commercially Important Fishes	11,000	1/21/66
Georgia	2-32-R	Preliminary Survey of Existing and Potential Marine Resources on the Georgia Coast	3,600	2/24/66
Guam	H-7-D	A Study to Determine the Feasibility of Developing a Deep-Sea Commercial Fishing Industry on Guam	34,333	3/25/66
Hawaii	H-1-D	Development of a Prawn Fishery	38,542	3/31/66
Hawaii	H-3-R	Central Pacific Tuna Conference	4,000	1/27/66
Hawaii	H-5-R	Management Investigation of Two Species of Spiny Lobsters	15,009	3/25/66
Illinois	4-13-R	Clam Industry in Illinois	15,000	1/18/66
Illinois	4-14-R	Investigation and Management of Commercial Fisheries	20,000	2/28/66
Massachusetts	3-38-R	Identification of Winter Flounder Sub-populations	20,000	2/4/66
Massachusetts	3-35-R	Marine Food Science and Technology Research on Sanitation and Handling for Purposes of Improving Product Quality and Shelf-life of Massachusetts Commercial Fishery Products	39,000	1/14/66
Massachusetts	3-39-C	Cat Cove Dike Repair	35,000	1/14/66
Massachusetts	3-40-S	Coordination of Research and Development	34,096	1/14/66
New York	3-10-C	Construction of a Marine Research and Development Laboratory	171,876	2/25/66
North Dakota	4-15-R	Garrison Reservoir Commercial Fishery Investigations	6,600	2/28/66
Oregon	1-25-R	Utilization of Hake for Human Food	19,000	2/7/66
Oregon	1-26-R	Biological Effects of Parasitized Hake in Relation to its Use as a Food	11,000	2/7/66
Oregon	1-28-R	Distribution and Abundance of Dungeness Crab	33,000	3/31/66

(Listing continued on next page)

State	Project	Title	Total First Year Cost	Date Approved
Rhode Island	3-43-R	Investigation of the Deep Sea Red Crab	10,500	2/10/66
Rhode Island	3-46-R	Investigation of the Basic Life History of the Red Crab	11,700	3/31/66
Virgin Islands	2-33-R	Study of the Fisheries Potential of the Virgin Islands	24,000	4/1/66
Washington	1-22-R	Monitor Condition of Certain Groundfish Stocks, Washington Trawl Grounds	40,000	3/21/66
Washington	1-23-R	Investigation of Pacific Ocean Perch, and other Sebastodes sp.	16,000	3/21/66
Washington	1-24-D	Inspection of Oyster Seed, New Asiatic Sources	6,000	2/25/66
Washington	1-29-R	Early Marine Life History, Chum and Pink Salmon	16,000	3/24/66
Washington	1-30-R	Field Recovery, Coded Wire Tag	18,300	3/25/66

Public Law 88-309, which was signed by the President on May 20, 1964, provides for payment of \$5 million annually to states for commercial fishery research and development over a five-year period. The states will be required to provide matching funds equal to at least 25 percent of project costs.

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

HEARINGS ON APPLICATIONS FOR FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY:

The following firms have applied for fishing vessel construction differential subsidies to aid in the construction of vessels to engage in various fisheries:

Grace & Philip, Inc., 159 Washington St., Gloucester, Mass. 01930, 110-foot wood vessel for groundfish, whiting, ocean catfish, flounder and other flat fish, porgy, herring, and other species for industrial uses. The Bureau of Commercial Fisheries, U. S. Department of the Interior, published the notice of the hearing in the March 30, 1966, Federal Register.

Liberty Queen, Inc.; Pacific Prince, Inc.; Liberty King, Inc.; Pacific Queen, Inc.; and

Pacific King, Inc.--all of the same address--582 Tuna St., Terminal Island, Calif. 90731, each for a 149.5-foot steel vessel for albacore, skipjack, and yellowfin tuna, mackerel, sardines, hake, and anchovies. Notices of the hearings appeared in the April 15, 1966, Federal Register.

Ann-B, Inc., 11516 Palatine Ave. North, Seattle, Wash. 98133, 85-foot vessel, for bottomfish, flounder and sole, halibut, sardine, tuna, herring, hake, crab, shrimp, scallop, and dogfish fisheries. Notice appeared in April 22, 1966, Federal Register.

Northbeach, Inc., 10572 14th Ave. Northwest, Seattle, Wash., 97-foot vessel, for bottomfish, halibut, flounder and sole, tuna, hake, herring, shrimp, crab, and scallop fisheries. Notice appeared in April 22, 1966, Federal Register.

Hearings on the economic aspects of the applications were scheduled to be held.

Note: See Commercial Fisheries Review, May 1966 p. 90.

APPLICATIONS FOR FISHING VESSEL LOANS:

The following applications have been received for loans from the U. S. Fisheries Loan Fund to aid in financing the construction or purchase of fishing vessels:

Firm and Address	Overall Size	Fisheries	Application Notice in <u>Federal Register</u>(1966).....
Frank Brenha, Jr., & Ida Marie Brenha 3146 Garrison St. San Diego, Calif. 92106	101 ft.	Tuna	April 1
George Bold & Fritz Bold 527 Finch Bldg. Aberdeen, Wash. 98520	74.9 ft.	Hake, bottomfish	"
Levi McKinley 1300 Number 2-A West 9th Juneau, Alaska 99801	34.7 ft.	Halibut, salmon	"

(Continued on next page)

Firm and Address	Overall Size	Fisheries	Application Notice in Federal Register (1966)
Samuel Martin Box 104 Seldovia, Alaska 99663	Gill-net vessel	Salmon	April 5
Glenn J. Couch P. O. Box 572 Homer, Alaska 99603	39 ft.	Salmon, halibut, Dungeness crab	April 7
Dorothy M. O'Hara, Inc. Tillson Wharf Rockland, Maine 04841	111 ft.	Groundfish, scallops, lobsters, flounder	April 9
David V. Hall P. O. Box 161 Petersburg, Alaska 99833	45.5 ft.	Salmon, halibut	April 16
Steven V. Hotch P. O. Box 195 Haines, Alaska 99827	34 ft.	Salmon in southeastern Alaskan waters	April 21
James M. Brandenburg 135 Sentar Rd. Carpinteria, Calif. 93013	57 ft.	Salmon, albacore, bottomfish	April 28
Richard L. Yates East Boothbay, Maine 04544	30 ft.	Lobster	April 28

Regulations and procedures governing fishery loans have been revised and no longer require that an applicant for a new or used vessel loan replace an existing vessel (Public Law 89-85; Fisheries Loan Fund Procedures--50 CFR Part 250, as revised August 11, 1965).

Note: See Commercial Fisheries Review, May 1966 p. 90.

REQUIREMENTS ADOPTED FOR CONDITION OF COATING OF U. S. STANDARDS FOR GRADES OF FROZEN RAW BREADED SHRIMP:

A proposal to adopt an amendment to U. S. Standards for Grades of Frozen Raw Breaded Shrimp (Title 50, Part 262) was published in the Federal Register, April 5, 1966, by the Bureau of Commercial Fisheries, Department of the Interior. The features of these changes are to correct certain typographical errors, and to provide for the inclusion of 20 percent of the sample unit in evaluating the factor "condition of coating."

A series of surveys and meetings have been held with the breaded shrimp industry following previous notices in the Federal Register. It is now mutually agreed that 20 percent of the sample unit should be used rather than the 10 percent factor when point deductions are assessed for the factor "condition of coating."

The changes as published in the Federal Register of April 5, 1966, which became effective on that date follow:

Title 50--WILDLIFE AND FISHERIES

Chapter II--Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER G--PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

PART 262--UNITED STATES STANDARDS FOR GRADES OF FROZEN RAW BREADED SHRIMP

Miscellaneous Amendments

Notice is hereby given that pursuant to the authority vested in the Secretary of the Interior by sections 203 and 205 of Title II of the Agricultural Marketing Act of 1946, as amended, and of the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of 1956, as amended, it is proposed to adopt an amendment to Title 50, Part 262--U. S. Standards for Grades of Frozen Raw Breaded Shrimp, as set forth below. The features of these changes are to correct certain typographical errors, and to provide for the inclusion of 20 percent of the sample unit in evaluating the factor "condition of coating."

The effective date of December 3, 1965, for the factor "condition of coating" was stated in the FEDERAL REGISTER of Tuesday, August 3, 1965, to allow the breaded shrimp industry time to modify and adjust its operations to meet the requirements of the higher standards of quality for breaded shrimp. Further extensions

of the effective date of the "condition of coating" were published in issuances of the Federal Register dated December 9, 1965, and February 16, 1966. Subsequently, a series of surveys and meetings have been held with industry and it is now mutually agreed that 20 percent of the sample unit should be used rather than the 10 percent factor when point deductions are assessed for the factor "condition of coating."

Inasmuch as this amendment involves a technical change in Title 50, Part 262, notice and public procedure thereon has been deemed unnecessary since persons affected have previously been given an opportunity to make suggestions, comments or objections to the proposed amendment.

Therefore, the proposed changes shall become effective on the date of publication in the Federal Register.

DONALD L. MCKERNAN,
Director.

APRIL 1, 1966.

1. Amend the last paragraph of § 262.21 (s) to read:

A proportionate amount of the loose breeding and frost must be added to the weight of the sample in paragraph (u) (2) (ii) of this section.

2. Amend § 262.25, Table 1—Schedule of Point Deductions for Rating in Frozen Breaded State, to read:

Factor	Quality description	Deductions allowed
1. Loose breeding or frost	2 percent but less than 3 percent.....	5
	3 percent but less than 5 percent.....	10
	5 percent or more.....	31
2. Ease of separation	Separate easily after being removed from carton and exposed to room temperature for not more than 4 minutes.	3
	Separate easily after being removed from carton and exposed to room temperature for not more than 6 minutes.	6
	Does not separate easily after being removed from carton and exposed to room temperature for 6 minutes.	10
3. Uniformity	Ratio of weight of largest to smallest breaded shrimp in sample unit as defined under section 262.21 (T):	
	Up to 1.50.....	0
	1.51-1.60.....	1
	1.61-1.70.....	2
	1.71-1.80.....	3
	1.81-1.90.....	4
	1.91-2.00.....	5
	2.01-2.10.....	6
	2.11-2.20.....	7
	2.21-2.30.....	8
	2.31-2.40.....	9
	Over 2.40.....	10
4. Condition of coating	Degree of halo or ballooning or holidays (identify type of defect by circling the proper word):	
	Slight—each 20 percent by count or fraction thereof.....	1
	Moderate—each 20 percent by count or fraction thereof.....	2
	Marked—each 20 percent by count or fraction thereof.....	3
	Excessive—each 20 percent by count or fraction thereof.....	10
5. Damaged breaded shrimp	For each 5 percent by count or fraction thereof.....	3
	Tail fin broken or missing, each 5 percent or fraction thereof (except in Type I, subtype C, and Type II, subtype C).	1
6. Extraneous material	If extraneous material, except filthy or deleterious substances, is found in more than one package per lot, the entire lot shall be declared substandard. ¹	

¹ Filthy or deleterious substances in food products constitute a violation of the Food, Drug, and Cosmetic Act. Products containing such substances are ineligible for the purpose of applying this document.

Note: See Commercial Fisheries Review, April 1966 p. 77.

* * * * *

PROPOSED REGULATIONS FOR EASTERN PACIFIC TUNA FISHERIES:

Donald L. McKernan, Director, U. S. Bureau of Commercial Fisheries, published a notice in the Federal Register, on May 25, 1966, giving notice that the Secretary of the Interior proposes to add regulations for the Eastern Pacific Tuna Fisheries consisting of Part 280--Yellowfin Tuna and Part 281--Restrictions on Tuna Imports.

Part 280--Yellowfin Tuna includes sections in connection with definitions, basis and purpose, catch limit, open season, closed season, restrictions applicable to cargo vessels, reports and record keeping, and persons and vessels exempted.

Part 281--provides a framework within which imports of yellowfin tuna would be denied entry into the United States from countries which do not cooperate in this international fisheries conservation program.

Interested persons were given the opportunity to submit any data, views, or arguments in writing and to comment orally at a public hearing on the proposed regulations for the Eastern Pacific Tuna Fisheries.

The proposed regulations as published in the Federal Register, May 25, 1966, follow:

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[50 CFR Parts 280, 281]

EASTERN PACIFIC TUNA FISHERIES

Notice of Proposed Rule Making

Notice is hereby given, pursuant to section 4(a) of the Administrative Procedure Act of June 11, 1946 (60 Stat. 237), and section 6(c) of the Tuna Conventions Act of 1950 (64 Stat. 778), as amended by the Act of October 15, 1962 (76 Stat. 923; 16 U.S.C. 955), that the Secretary of the Interior proposes to amend Title 50, Code of Federal Regulations, by adding a new Subchapter H—Eastern Pacific Tuna Fisheries, consisting of Part 280—Yellowfin Tuna and Part 281—Restrictions on Tuna Imports. The proposed regulations are set forth in tentative form below.

The proposed regulations are to be issued under the authority contained in subsection (c) of section 6 of the Tuna Conventions Act of 1950, as added by the Act of October 15, 1962. In accordance with the authority cited, after adoption of the regulations proposed as Part 280 and publication thereof in the Federal Register, such regulations are to become applicable to all vessels and persons subject to the jurisdiction of the United States on such date as the Secretary of the Interior shall prescribe, but in no

event prior to an agreed date for the application by all countries whose vessels engage in fishing for species of fish covered by the Convention for the Establishment of an Inter-American Tropical Tuna Commission (1 U.S.T. 230), in the regulatory area on a meaningful scale of effective measures for the implementation of the Commission's recommendations applicable to all vessels and persons subject to their respective jurisdictions. Steps are being taken to reach agreement with the several countries whose fishermen participate in the tuna fisheries of the eastern Pacific Ocean looking toward _____ as the date for the simultaneous application by all such countries of suitable conservation measures to be observed by their fishing vessels.

Prior to the final adoption of the proposed regulations, consideration will be given to any data, views, or arguments pertaining thereto which are submitted in writing to the Regional Director, Pacific Southwest Region, Bureau of Commercial Fisheries, 101 Seaside Avenue, Terminal Island, Calif., 90731, within the period of 30 days from the date of publication of this notice in the *FEDERAL REGISTER*. Interested persons will also be afforded an opportunity to comment orally on the proposed regulations at a public hearing to be held at United Portuguese Club, 2818 Addison Street, San Diego, Calif., beginning at 10 a.m., June 14, 1966. Any person who intends to present views orally at such hearing is requested to furnish in writing his name and the name of the organization he represents, if any, to the said Regional Director not later than June 7, 1966.

Issued at Washington, D.C., and dated May 23, 1966.

DONALD L. MCKERNAN,
Director.

SUBCHAPTER H—EASTERN PACIFIC TUNA FISHERIES

PART 280—YELLOWFIN TUNA

- Sec.
280.1 Definitions.
280.2 Basis and purpose.
280.3 Catch limit.
280.4 Open season.
280.5 Closed season.
280.6 Restrictions applicable to cargo vessels.
280.7 Reports and record keeping.
280.8 Persons and vessels exempted.

AUTHORITY: The provisions of this Part 280 issued under sec. 6, 64 Stat. 778, as amended, 16 U.S.C. 955.

§ 280.1 Definitions.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

(a) *Convention*. The Convention for the Establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, by the United States of America and the Republic of Costa Rica (1 U.S.T. 230).

(b) *Commission*. The Inter-American Tropical Tuna Commission established pursuant to the Convention.

(c) *Director of Investigations*. The Director of Investigations, Inter-American Tropical Tuna Commission, La Jolla, Calif.

(d) *Bureau Director*. The Director of the Bureau of Commercial Fisheries, Fish

and Wildlife Service, U.S. Department of the Interior.

(e) *Regional Director*. The Regional Director, Pacific Southwest Region, Bureau of Commercial Fisheries, 101 Seaside Avenue, Terminal Island, Calif.

(f) *Regulatory area*. All waters of the eastern Pacific Ocean bounded by the mainland of the Americas and the following lines: Beginning at a point on the mainland where the parallel of 40 degrees north latitude intersects the coast; thence due west to the meridian of 125 degrees west longitude; thence due south to the parallel of 20 degrees north latitude; thence due east to the meridian of 120 degrees west longitude; thence due south to the parallel of 5 degrees north latitude; thence due east to the meridian of 110 degrees west longitude; thence due south to the parallel of 10 degrees south latitude; thence due east to the meridian of 90 degrees west longitude; thence due south to the parallel of 30 degrees south latitude; thence due east to a point on the mainland where the parallel of 30 degrees south latitude intersects the coast.

(g) *Yellowfin tuna*. Any fish of the species *Thunnus albacares* (synonymy: *Neothunnus macropterus*).

(h) *Other tuna fishes*. Those species (and none other) of the family Scombridae which are known as:

(1) Albacore—*Thunnus alalunga* (synonymy: *Thunnus germon*).

(2) Bigeye—*Thunnus obesus* (synonymy: *Parathunnus sibi*).

(3) Bluefin—*Thunnus thynnus* (synonymy: *Thunnus saliens*).

(4) Skipjack—*Euthynnus pelamis* (synonymy: *Katsuwonus pelamis*).

(i) *Fishing vessel*. Every kind, type, or description of watercraft subject to the jurisdiction of the United States (other than purse seine skiffs) used in or outfitted for catching or processing fish or transporting its catch of fish from fishing grounds.

(j) *Cargo vessel*. Every kind, type, or description of watercraft which is not employed in fishing but which is engaged in whole or in part in the transportation of fish or fish products.

(k) *Person*. Individual, association, corporation, or partnership subject to the jurisdiction of the United States.

(l) *Open season*. The time during which yellowfin tuna may lawfully be captured and taken on board a fishing vessel in the regulatory area without limitation on the quantity permitted to be retained during each fishing voyage. Unless otherwise specified, whenever time is stated in hours it shall be construed to refer to standard time in the area affected.

(m) *Closed season*. The time during which yellowfin tuna may not be taken or retained on board a fishing vessel in quantities exceeding the amounts permitted to be taken and retained as an incident to fishing for other tuna fishes.

§ 280.2 Basis and purpose.

(a) At a special meeting held at Long Beach, Calif., on September 14, 1961, the Commission recommended to the Governments of Costa, Rica, Ecuador, Panama, and the United States of America, parties to the Convention, that they take joint action to limit the annual catch of yellowfin tuna from the eastern Pacific Ocean by fisherman of all nations during the calendar year 1962. This recom-

mendation was made pursuant to paragraph 5 of Article II of the Convention on the basis of scientific investigations conducted by the Commission over a period of time dating from 1951. The most recent years of this period were marked by a substantial increase in fishing effort directed toward the yellowfin tuna stocks, resulting in a rate of exploitation of these stocks greater than that at which the maximum average sustainable yield may be obtained. The Commission's recommendation for joint action by the parties to regulate the yellowfin tuna fishery has as its objective the restoration of these stocks to a level of abundance which will permit maximum average sustainable catch and the maintenance of the stocks in that condition in the future.

(b) At annual meetings held at Quito, Ecuador, May 16-18, 1962; at Panama City, Panama, April 16-17, 1963; at San Diego, Calif., March 18-19, 1964; at Mexico City, Mexico, March 23-24, 1965; at Guayaquil, Ecuador, April 19-20, 1966, the Commission affirmed its conclusions regarding the need for regulating the yellowfin tuna fishery in the eastern Pacific Ocean and at each meeting recommended to the parties to the Convention that they take joint action to:

(1) Establish a prescribed tonnage limit on the total catch of yellowfin tuna by the fishermen of all nations during each calendar year from an area of the eastern Pacific Ocean defined by the Commission;

(2) Establish open and closed seasons for yellowfin tuna under prescribed conditions;

(3) Permit the landing of not more than fifteen percent (15%) by weight of yellowfin tuna among the tuna taken on a fishing trip made after the close of the yellowfin tuna fishing season; and

(4) Obtain from governments not parties to the Convention, but having vessels which operate in the fishery, cooperation in effecting the recommended conservation measures.

(c) The regulations in this part are designed to implement the Commission's recommendations for the conservation of yellowfin tuna so far as they affect all vessels and persons subject to the jurisdiction of the United States.

§ 280.3 Catch limit.

The annual limitation on the quantity of yellowfin tuna permitted to be taken from the regulatory area during the open season by the fishing vessels of all nations participating in the fishery will be fixed and determined on the basis of recommendations made by the Commission pursuant to paragraph 5 of Article II of the Convention. Upon approval by the Secretary of State and the Secretary of the Interior of the recommended catch limit, announcement of the catch limit thus established shall be made by the Bureau Director through publication of a suitable notice in the *FEDERAL REGISTER*. The Bureau Director, in like manner, shall announce any revision or modification of an approved annual catch limit which may subsequently enter into force.

§ 280.4 Open season.

The open season for yellowfin tuna fishing shall begin annually at 12:01 a.m.

of the first day of January and terminate at midnight on a date to be determined and announced as provided in § 280.5.

§ 280.5 Closed season.

(a) Pursuant to authority granted by the Commission, the Director of Investigations maintains records of the catches of yellowfin tuna made in the regulatory area from time to time during the open season by the fishing vessels of all nations participating in the fishery. By taking into account the cumulative round weight of such yellowfin tuna catches and the estimated additional quantities of yellowfin tuna expected to be caught by the fishing vessels of all nations operating in the regulatory area, the Director of Investigations will determine the date on which he deems the annual catch limit will be reached and will promptly notify the Bureau Director of such date. The Bureau Director shall announce the season closure date thus established by publication in the FEDERAL REGISTER. The closure date so announced shall be final except that if it shall at any time become evident to the Director of Investigations that the catch limit will not be reached by such date, he may substitute another date which shall be announced by the Bureau Director in like manner as provided for the date originally determined.

(b) Except as provided in paragraphs (c) and (d) of this section, after the date determined in the manner provided in this section for the closing of the yellowfin tuna fishing season, it shall be unlawful for any master or other person in charge of a fishing vessel to possess on board such vessel or to bring yellowfin tuna to any port or place in the United States until the yellowfin tuna fishing season reopens on January 1 next following the close of the season.

(c) Any fishing vessel which has departed port to engage in yellowfin tuna fishing prior to the date of the closure of the yellowfin fishing season may continue to take and retain yellowfin tuna without restriction as to quantity until the fishing voyage has been completed by unloading from such fishing vessel the whole or any part of the cargo of tuna taken during such voyage.

(d) After the close of the yellowfin tuna fishing season as provided in this section, yellowfin tuna captured as an incident to fishing for other tuna fishes may be taken on board a fishing vessel and brought to any port or place in the United States in an amount not exceeding fifteen percent (15%) by round weight of all tuna fishes on board the fishing vessel.

(e) The limitation on the quantity of incidentally caught yellowfin tuna specified in paragraph (d) of this section shall be applicable to any fishing vessel irrespective of its arrival in the United States prior or subsequent to December 31 in every case where the catch of tuna has been made during a fishing voyage begun in the closed season.

§ 280.6 Restrictions applicable to cargo vessels.

(a) A fishing vessel shall be deemed to have completed a fishing voyage whenever the whole or any part of its catch of tuna from the regulatory area shall be transferred to a cargo vessel in

conformity with the requirements of this section.

(b) In keeping with the provisions of section 251, Title 46, United States Code, no foreign-flag vessel, whether documented as a cargo vessel or otherwise, is permitted to land in a port of the United States any tuna fish or tuna fish products taken on board such vessel on the high seas.

(c) The transfer of tuna from a fishing vessel to a cargo vessel while in a foreign country or its territorial waters will be governed by the laws and regulations of such foreign country.

(d) During the closed season for yellowfin tuna, no fishing vessel shall transfer on the high seas any part of its catch of tuna fish to a cargo vessel documented under the laws of the United States and no such cargo vessel shall receive, possess, or bring to any place in the United States, tuna fish taken on board on the high seas from a fishing vessel unless the cargo vessel shall hold a permit issued in conformity with paragraph (e) of this section.

(e) Upon written application made to him, the Regional Director may issue a permit authorizing a cargo vessel documented under the laws of the United States, to receive, possess, and transport to the United States, tuna fish transferred from fishing vessels on the high seas during the closed season on yellowfin tuna. Such permit may authorize the possession and transportation of yellowfin tuna by a cargo vessel without regard to the quantities of yellowfin or other tuna fishes received or possessed on board such vessel during the closed season on yellowfin tuna and shall contain such additional conditions and restrictions as the Regional Director shall determine to be necessary in light of the circumstances in each case to achieve compliance with the regulations in this part and the objectives of the program for the conservation of the yellowfin tuna resources of the regulatory area.

§ 280.7 Reports and record keeping.

The master or other person in charge of a fishing vessel or such person as may be authorized in writing to serve as the agent of either of such persons shall—

(a) Annually, prior to the initial departure of such vessel to engage in yellowfin tuna fishing, furnish to the Regional Director (either by letter or on a form obtainable from the Regional Director) a report specifying the name, official number, home port, and cargo capacity (in tons of frozen tuna) of the vessel, and the names and addresses of the managing owner and master, respectively, of the vessel intended to be used in fishing for yellowfin tuna in the regulatory area.

(b) Not earlier than 48 hours prior to each departure from port to engage in fishing for yellowfin tuna during the open season for such tuna, furnish to the Regional Director, either by letter, telegram, radiogram, or on a form obtainable from the Regional Director, a report certifying that all tuna fishes taken during the immediately preceding fishing voyage, if any, have been unloaded and that the vessel is departing port to engage in or resume yellowfin tuna fishing. A report as required by this subsection shall be dispatched from the vessel's port of departure for a fish-

ing voyage and if in letter form the report shall be dispatched by airmail in every case except from ports of departure on the Pacific coast of the United States, where surface mail may be used for such purpose. A copy of the report showing the date of dispatch of the original shall be authenticated by affixing the stamp, seal, or signature of the postal official or employee of the telegraph or radiogram company transmitting the report, as the case may be, and such authenticated copy shall be retained on board the reporting vessel for a period of 6 months following the date of the report. The failure of any vessel, irrespective of cause, to depart upon a fishing voyage within the 48-hour period specified in this subsection shall require the furnishing in like manner of a new report not earlier than 48 hours prior to the delayed departure time.

(c) Keep an accurate log of all operations conducted from the vessel, entering therein for each day the date, noon position (stated in latitude and longitude or in relation to known physical features) and the estimated quantities (in short tons, round weight), of tuna fish by species which are taken on board the vessel: *Provided*, That the record and bridge log maintained at the request of the Commission shall be deemed a sufficient compliance with this paragraph whenever the items of information specified herein are fully and accurately entered in such log.

(d) Report by radio at least once each calendar week during a fishing voyage conducted in the open season; such reporting to begin on a date to be announced by the Bureau Director through publication of a suitable notice in the FEDERAL REGISTER and to continue throughout the open season. Reports by radio shall be made directly or through a cooperating vessel to Radio Station WWD, La Jolla, Calif., 4415.8 kc, 8805.6 kc, 12403.5 kc, or 16533.5 kc or by prepaid commercial radio message directed to the Director of Investigations. Radio reports shall be made between 0900 and 2400 P.s.t. and shall state the name of the fishing vessel and the cumulative estimated quantities, by species, of all tuna fish taken on board from week to week throughout the duration of the fishing voyage. Weekly reports containing all items of information required by this subsection may be submitted to the Director of Investigations by the shore representative of the master or other person in charge of the vessel in lieu of radio reports from the vessel.

(e) Furnish on a form obtainable from the Regional Director, following the delivery or sale of a catch of tuna made by means of such vessel, a report, certified to be correct as to facts within the knowledge of the reporting individual, giving the name and official number of the fishing vessel, the dates of commencement and conclusion of the fishing voyage and listing separately by species and round weight in pounds or short tons, the gross quantities of each species of tuna fish so sold or delivered: *Provided*, That, at the option of the vessel master or other person in charge, a copy of the fish ticket, weigh-out slip, settlement sheet, or similar record customarily issued by the fish dealer or his agent may be used for reporting purposes, in lieu of the form obtainable from the Regional Director,

If such alternate record is similarly certified and contains all items of information required by this paragraph: *Provided further*, That for any vessel landing its catch in California and reporting by means of a copy of the California fish ticket, the California Fish and Game boat number may be indicated in lieu of the vessel's official number. Such report shall be delivered or dispatched by mail to the Regional Director within 72 hours after the weigh-out has been completed.

§ 280.8 Persons and vessels exempted.

Nothing contained in §§ 280.2 to 280.7 shall apply to:

(a) Any person or vessel authorized by the Commission, the Bureau Director, or any State of the United States to engage in fishing for research purposes.

(b) Any person or vessel engaged in sport fishing for personal use.

PART 281—RESTRICTIONS ON TUNA IMPORTS

Sec.

281.1 Definitions.

281.2 Basis and purpose.

281.3 Species subject to regulation.

281.4 Species under investigation by the Commission.

281.5 Investigations authorized.

281.6 Publication of findings.

281.7 Proof of admissibility.

281.8 Removal of import restrictions.

AUTHORITY: The provisions of this Part 281 issued under sec. 6, 64 Stat. 776, as amended, 16 U.S.C. 935.

§ 281.1 Definitions.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

(a) *United States*. All areas under the sovereignty of the United States, the Trust Territory of the Pacific Islands, and the Canal Zone.

(b) *Convention*. The Convention for the Establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, by the United States of America and the Republic of Costa Rica (1 U.S.T. 230).

(c) *Commission*. The Inter-American Tropical Tuna Commission established pursuant to the Convention.

(d) *Bureau Director*. The Director of the Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior.

(e) *Regulatory area*. All waters of the eastern Pacific Ocean bounded by the mainland of the Americas and the following lines: Beginning at a point on the mainland where the parallel of 40 degrees north latitude intersects the coast; thence due west to the meridian of 125 degrees west longitude; thence due south to the parallel of 20 degrees north latitude; thence due east to the meridian of 120 degrees west longitude; thence due south to the parallel of 5 degrees north latitude, thence due east to the meridian of 110 degrees west longitude; thence due south to the parallel of 10 degrees south latitude; thence due east to the meridian of 90 degrees west longitude; thence due south to the parallel of 30 degrees south latitude; thence due east to a point on the mainland where the parallel of 30 degrees south latitude intersects the coast.

(f) *Yellowfin tuna*. Any fish of the species *Thunnus albacares* (synonym: *Neothunnus macropterus*).

(g) *Other tuna fishes*. Those species (and none other) of the family Scombridae which are known as:

(1) Albacore—*Thunnus alalunga* (synonym: *Thunnus germon*).

(2) Bigeye—*Thunnus obesus* (synonym: *Parathunnus sibi*).

(3) Bluefin—*Thunnus thynnus* (synonym: *Thunnus valens*).

(4) Skipjack—*Euthynnus pelamis* (synonym: *Katsuwonus pelamis*).

(h) *Fishing vessel*. Every kind, type, or description of watercraft (other than purse seine skiffs) used in or outfitted for catching or processing fish or transporting fish from fishing grounds.

(i) *Person*. Individual, association, corporation, or partnership.

§ 281.2 Basis and purpose.

(a) At a special meeting held at Long Beach, Calif., on September 14, 1961, the Commission recommended to the Governments of Costa Rica, Ecuador, Panama, and the United States of America, parties to the Convention, that they take joint action to limit the annual catch of yellowfin tuna from the eastern Pacific Ocean by fishermen of all nations during the calendar year 1962. This recommendation was made pursuant to paragraph 5 of Article II of the Convention on the basis of scientific investigations conducted by the Commission over a period of time dating from 1951. The most recent years of this period were marked by a substantial increase in fishing effort directed toward the yellowfin tuna stocks, resulting in a rate of exploitation of these stocks greater than that at which the maximum average sustainable yield may be obtained. The Commission's recommendation for joint action by the parties to regulate the yellowfin tuna fishery has as its objective the restoration of these stocks to a level of abundance which will permit maximum average sustainable catch and the maintenance of the stocks in that condition in the future.

(b) At annual meetings held at Quito, Ecuador, May 16-18, 1962; at Panama City, Panama, April 16-17, 1963; at San Diego, Calif., March 18-19, 1964; at Mexico City, Mexico, March 23-24, 1965; and at Guayaquil, Ecuador, April 19-20, 1966, the Commission affirmed its earlier conclusions regarding the need for regulating the yellowfin tuna fishery in the eastern Pacific Ocean and at each meeting recommended to the parties to the Convention that they take joint action to:

(1) Establish a prescribed tonnage limit on the total catch of yellowfin tuna by the fishermen of all nations during each calendar year from an area of the eastern Pacific Ocean defined by the Commission;

(2) Establish open and closed seasons for yellowfin tuna under prescribed conditions;

(3) Permit the landing of not more than 15 percent (15%) by weight of yellowfin tuna among the tuna taken on a fishing trip made after the close of the yellowfin tuna fishing season; and

(4) Obtain from governments not parties to the Convention, but having vessels which operate in the fishery, cooperation

in affecting the recommended conservation measures.

(c) In conformity with the provisions of section 6(c) of the Act and simultaneously with the adoption of the regulations in this part, the Secretary of the Interior has made effective Part 280 of this title for the purpose of carrying out the recommendations of the Commission for the conservation of yellowfin tuna in the regulatory area so far as such recommendations affect all vessels and persons subject to the jurisdiction of the United States.

(d) The yellowfin tuna stocks recommended for regulation by the Commission constitute a significant part of an international high seas fishery in which the vessels of a number of countries are engaged in varying degrees. Since some of the countries are not parties to the Convention and, therefore, have no applicable treaty obligations to fulfill, the achievement of the conservation objectives with respect to the tuna resources of the eastern Pacific Ocean is dependent upon international cooperative efforts to implement the Commission's recommendations. With a view toward encouraging effective cooperation on the part of such countries, the Tuna Conventions Act of 1950, as amended, directs that restrictions be established on the importation of certain tuna fish from any country which shall fail to take action to prevent the occurrence of certain proscribed activities. Thus, section 6(c) of the Act provides that the Secretary of the Interior, with the concurrence of the Secretary of State, shall promulgate regulations—

(1) To prohibit the entry into the United States, from any country when the vessels of such country are being used in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission, of fish in any form of those species which are subject to regulation pursuant to a recommendation of the Commission and which were taken from the regulatory area; and

(2) To prohibit entry into the United States, from any country, of fish in any form of those species which are subject to regulation pursuant to a recommendation of the Commission and which were taken from the regulatory area by vessels other than those of such country in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission.

(e) Section 6(c) of the Act further provides that "in the case of repeated and flagrant fishing operations in the regulatory area by the vessels of any country which seriously threaten the achievement of the objectives of the Commission's recommendations, the Secretary of the Interior, with the concurrence of the Secretary of State, may, in his discretion, also prohibit the entry from such country of such other species of tuna, in any form, as may be under investigation by the Commission and which were taken in the regulatory area."

(f) By letter of May 8, 1964, the Secretary of State concurred in the promulgation of the regulations in this part. Such regulations are designed to implement the provisions of section 6(c) of the Act with respect to import controls and to prescribe procedures for the establishment of restrictions on imports of

tuna whenever such action shall be deemed warranted.

§ 281.3 Species subject to regulation.

The species of fish currently subject to regulation pursuant to a recommendation of the Commission within the meaning of section 6(c) of the Act is yellowfin tuna.

§ 281.4 Species under investigation by the Commission.

The species of fish currently under investigation by the Commission within the meaning of section 6(c) of the Act are yellowfin tuna, skipjack tuna, and bigeye tuna.

§ 281.5 Investigations authorized.

(a) The Bureau Director shall cause to be made from time to time such inquiries and investigations as may be necessary to keep himself and other persons concerned currently informed regarding the nature and effectiveness of the measures for the implementation of the Commission's recommendations which are being carried out by countries whose vessels engage in fishing within the regulatory area. In making a finding as to whether or not a country is condoning the use of vessels in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission, the Bureau Director shall take into account, among such other considerations as may appear to be pertinent in a particular case, the following factors:

(1) Whether or not the country provides or causes to be provided to the Commission pertinent statistics on a timely basis.

(2) Whether or not the country has in force conservation measures applicable to its own fishermen adequate for the implementation of the Commission's recommendations.

(3) Whether or not the country has in force measures for the control of landings in its ports of species subject to regulation which are taken in the regulatory area by fishermen of other countries contrary to the Commission's conservation recommendations.

(4) Whether or not the country, having put conservation measures into effect, takes reasonable action to enforce such measures.

(5) The number of vessels of the country which conduct fishing operations in the regulatory area.

(6) The quantity of species subject to regulation taken from the regulatory area by the country's vessels contrary to the Commission's conservation recommendations and its relationship to (1) the total quantity permitted to be taken by the vessels of all countries participating in the fishery and (2) the quantity of such species sought to be restored to the stocks of fish pursuant to the Commission's conservation recommendations.

(7) Whether or not repeated and flagrant fishing operations in the regulatory area by the vessels of the country seriously threaten the achievement of the objectives of the Commission's recommendations.

(b) Any person who shall have reason to believe that the vessels of any country

are being used in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission or that other acts within the purview of the import control provisions of section 6(c) of the Tuna Conventions Act of 1950, as amended, are occurring or are likely to occur, may communicate his belief to the Bureau Director. Every such communication shall contain or be accompanied by a full statement of the reasons for the belief, including a detailed description of such specific acts or events as may support the belief, and such other pertinent facts as may indicate a need for instituting an investigation as authorized in this part.

(c) Upon receipt by the Bureau Director of any communication submitted pursuant to paragraph (b) of this section and found to comply with the requirements of that paragraph, the Bureau Director promptly shall cause such investigation to be made as appears to be warranted by the circumstances of the case. In conducting such investigation the Bureau Director or his designated representative shall consider any representations offered by foreign interests, importers, brokers, domestic producers, or other interested persons. Unless good cause to the contrary shall exist, every such investigation shall be completed within 60 days following receipt of the communication.

§ 281.6 Publication of findings.

If it shall be determined on the basis of section 281.5 that species of fish subject to regulation or under investigation by the Commission, as the case may be, are ineligible for entry into the United States from a particular country pursuant to the provisions of section 6(c) of the Act, the Bureau Director, with the approval of the Secretary of the Interior and, when required by law, with the concurrence of the Secretary of State, shall publish a finding to that effect in the FEDERAL REGISTER. Effective upon the date of publication of such finding in the FEDERAL REGISTER every shipment of fish in any form of the species under regulation or under investigation by the Commission offered for entry either directly or indirectly from the country named in the finding shall be denied entry unless it shall be established by satisfactory proof pursuant to § 281.7 that a particular shipment of such fish is not ineligible for entry; *Provided*, That entry shall not be denied and no such proof shall be required for any such shipment which, on the date of such publication, was in transit to the United States on board a vessel operating as a common carrier.

§ 281.7 Proof of admissibility.

For the purposes of § 281.6 of this part and section 6(c) of the Tuna Conventions Act of 1950, as amended, a shipment of fish in any form of the species under regulation or under investigation by the Commission offered for entry, directly or indirectly, from a country named in a finding published under such § 281.6 shall be deemed to be eligible for entry if the shipment is accompanied by a certificate of eligibility, executed in the form and manner set forth below,

certifying that the tuna in the shipment are not of the species specified in the published finding or, if of such species, were not taken in the regulatory area. The required certificate of eligibility must be executed by a duly authorized official of the country named in the published finding and the certificate must be authenticated with respect to the signature and official position of the person executing the same by a consular officer or consular agent of the United States.

CERTIFICATE OF ELIGIBILITY

I, _____, an authorized officer of the Government of _____, certify that the shipment of tuna fish accompanied by this certificate, consisting of _____ of _____ (Quantity) (Species) in _____ (Number and kind of packages or containers) bearing the following marks and numbers _____

(a) Contains no fish of the species prohibited entry into the United States by virtue of a finding of ineligibility published under regulations issued pursuant to section 6(c) of the Tuna Conventions Act of 1950, as amended.

(b) Contains fish of the species prohibited entry into the United States by virtue of a finding of ineligibility published under regulations issued pursuant to section 6(c) of the Tuna Conventions Act of 1950, as amended, but that such fish were caught in the waters of _____

(Identify area or areas in which fish were taken) _____, and that none of the said fish (Country) was taken in any part of the eastern Pacific Ocean subject to conservation regulations pursuant to recommendations of the Inter-American Tropical Tuna Commission.

(Signature) _____

(Title) _____

[This certificate must be accompanied by a certificate of authentication executed by a consular officer or consular agent of the United States.]

§ 281.8 Removal of import restrictions.

Upon a determination by the Bureau Director that the conditions no longer exist which warranted the imposition of import restrictions against the country named in the finding published pursuant to § 281.6, the Bureau Director, with the approval of the Secretary of the Interior, shall publish a finding to such effect in the FEDERAL REGISTER. Effective upon the date of publication of such finding, the prior existing import restrictions against the country designated therein shall terminate: *Provided*, That for a period of 1 year from such date of publication every shipment of fish in any form of the species subject to regulation or under investigation by the Commission shall continue to be denied entry unless the shipment is accompanied by a certification executed by an authorized official of the country of export and authenticated by a consular officer or consular agent of the United States, certifying that no portion of the shipment is comprised of fish which are of species under regulation and which were prohibited from entry under the prior existing import restrictions.

U. S. Tariff Commission

HEARING ON IMPORT DUTIES FOR CERTAIN PRODUCTS INCLUDING CANNED CLAMS:

The United States Tariff Commission has ordered a public hearing to be held in connection with an investigation instituted under section 332 of the Tariff Act of 1930 on certain products including "certain canned clams" which for import duty purposes are subject to the American selling price basis of valuation. Notice of the institution of the investigation was issued on December 23, 1965, and was published in the Federal Register on December 29, 1965.

The hearing was scheduled to be held in Washington, D. C., on June 8, 1966. Information and views were to be submitted either in writing or by oral testimony at the public hearing, or both. Interested parties desiring to appear and to be heard were requested to notify the Secretary of the Commission, in writing, at least three days in advance of the date set for the hearing. Written submissions were to be received by the Commission not later than June 10, 1966.

The Notice of Investigation and Date of Hearing was announced by the Tariff Commission on May 2, 1966, and published in the Federal Register, May 5, 1966.

In connection with its investigation, the Commission published a list of converted rates of duty for clams other than razor clams (including clam pastes and sauces but not clam chowder) in airtight containers. Included also are whole clam meats, minced clam meats, smoked whole clam meats, clam sauce, and oriental specialties (seasoned, baked, and broiled clams canned in Japan). Copies of the list, titled "List of Tentative Converted Rates of Duty Together with Explanatory Material," were available from the U. S. Tariff Commission, Washington, D. C. 20436, and New York, N. Y.

Note: See Commercial Fisheries Review, February 1966, p. 90.



Department of the Treasury

BUREAU OF CUSTOMS

TUNA CANNED IN BRINE IMPORT QUOTA FOR 1966:

The quantity of tuna canned in brine which may be imported into the United States during

calendar year 1966 at the 12½ percent rate of duty is limited to 65,662,200 pounds (or about 3,126,771 standard cases of 48 7-oz. cans). This is 0.6 percent less than the 66,059,400 pounds (about 3,145,685 cases) in 1965; but 7.8 percent more than the 60,911,870 pounds (about 2,900,565 cases) in 1964; 4.0 percent more than the 63,130,642 pounds (about 3,006,221 cases) in 1963; and 11.2 percent over the 59,059,014 pounds (about 2,812,000 cases) in 1962. Compared with the 57,114,714 pound limit in 1961, the 1966 quota is about 15.0 percent greater, and is 22.9 percent more than the 53,448,330-pound limit set in 1960. Any imports of tuna canned in brine in excess of the 1966 quota will be dutiable at 25 percent ad valorem under item 112.34, Tariff Schedules of the United States.

The quota for 1966 is based on the United States pack of canned tuna during the preceding calendar year (1965), as reported by the U. S. Fish and Wildlife Service.

The 1966 tariff-rate quota was published in the Federal Register, page 6324, April 26, 1966, by the Bureau of Customs of the U. S. Department of the Treasury.

Note: See Commercial Fisheries Review, July 1965 p. 104.

* * * * *

INQUIRY INSTITUTED ON FISHERY PRODUCTS IMPORTED FROM U. S. S. R.:

The Bureau of Customs, U. S. Department of the Treasury, received information recently indicating a possibility that fishery products imported from the Soviet Union are being, or likely to be, sold at less than fair value within the meaning of the Antidumping Act, 1921, as amended. In order to establish the validity of such information, the Bureau of Customs is instituting an inquiry based on provisions of the Customs Regulations.

A summary of the information received and developed within the Customs Service states: "The product and price information discloses that substantial quantities of fishery products referred to as shellfish and mollusks are being sold to the U. S. purchaser at prices substantially lower than those normally pertaining to such or similar fishery products imported from countries not having a controlled economy."

According to the Treasury Department, U. S. imports of the merchandise involved from January 1, 1966, to date amounted to about \$375,000.

An Antidumping Proceeding Notice, Fishery Products from the U.S.S.R., was published by the Commissioner of Customs in the Federal Register, April 19, 1966.



Eighty-Ninth Congress (Second Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

COMMERCIAL FISHERIES RESOURCES SURVEY: The Subcommittee on Merchant Marine and Fisheries of Senate Committee on Commerce Apr. 19, 1966, hearings on S. J. Res. 29, authorizing a survey of marine and fresh water commercial fishery resources of the U. S., and its possessions, having as its witnesses Dr. Stanley A. Cain, Assistant Secretary for Fish and Wildlife and Parks, and Donald L. McKernan, Director, Bureau of Commercial Fisheries, both of the U. S. Department of the Interior. In a statement, the Bureau's director said that such a survey "would provide a useful summary of the status of our fisheries at this critical stage of their history. It would provide the Congress, the fishing industry, the public, and the Department with an inventory of resources now utilized or still lying unused in our inland and marine waters, their condition and potential yield. It would identify the methods by which these resources can be managed for full utilization and how their value could be enhanced by appropriate legislation or technological development. . . . In view of the development of foreign fishing off our coasts utilizing resources important to the full development of United States fisheries, the survey contemplated by this proposal becomes increasingly significant."

COMMODITY PACKAGING AND LABELING: Introduced in House H. R. 14498 (Vanik), Apr. 19, 1966, and H. R. 14633 (Donohue), Apr. 26, 1966, to regulate interstate and foreign commerce by preventing the use of unfair or deceptive methods of packaging or labeling of certain consumer commodities distributed in such commerce, and for other purposes; to Committee on Interstate and Foreign Commerce.

Senate Committee on Commerce Apr. 20, 1966, met in executive session to continue consideration of S. 985, proposed Fair Packaging and Labeling Act of 1966, but did not conclude action thereon and will meet again on Wednesday, Apr. 27.

ECOLOGICAL RESEARCH AND SURVEY: Senate Committee on Interior and Insular Affairs held hearings Apr. 27, 1966, on S. 2282, to authorize the Secretary of the Interior to conduct a program of research, study, and surveys, documentation and description of the natural environmental systems of the United States for the purpose of understanding and evaluating the condition of these systems and to provide information to those concerned with natural resources management. Testimony was received from Secretary Stewart L. Udall and Dr. Stanley Cain, Assistant Secretary for Fish and Wildlife and Parks, both of the Department of the Interior.

ESTUARINE INVESTIGATION: S. 3240 (Tydings and 1 other) introduced in Senate Apr. 19, 1966, to amend the Federal Water Pollution Control Act so as to provide for a study and investigation of estuaries and estuarine zones of the United States; to Committee on Public Works. Rep. Tydings pointed out in Congressional Record, Apr. 19, 1966 (pp. 7910-7911), that bill would authorize the Secretary of the Interior to initiate a 3-year, \$3 million comprehensive study of pollution in the tidal estuaries and their immediately adjacent land areas. The Interior Department will issue a comprehensive report, once the project is completed. This report will be the first comprehensive accumulation of estuarine knowledge to ever exist. As such, it will be of enormous value to laymen and scientists alike, of this country and of others, who are concerned about this most vital of areas.

FACTORY FISHING VESSELS: H. R. 14459 (Hathaway) introduced in House Apr. 19, 1966, to assist the domestic construction of three advanced-design factory fishing vessels; to Committee on Merchant Marine and Fisheries.

FISH AND WILDLIFE COORDINATION ACT AMENDMENT--FEDERALLY LICENSED PROJECTS (EFFECTS ON FISH AND WILDLIFE): H. R. 15001 (Ottinger) introduced in House May 11, 1966, to amend the Fish and Wildlife Coordination Act to provide adequate notice and opportunity for the Secretary of the Interior and State fish and wildlife agencies to conduct studies on the effects of projects licensed by Federal agencies on fish and wildlife resources, and for other purposes; to Committee on Merchant Marine and Fisheries.

Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries held hearings May 11, 1966, on H. R. 9492, to amend the Fish and Wildlife Coordination Act to provide adequate notice and opportunity for the Secretary of the Interior and State fish and wildlife agencies to conduct studies on the effects of projects licensed by Federal agencies on fish and wildlife resources; H. R. 14414, to amend the Fish and Wildlife Coordination Act to make it applicable to the Atomic Energy Commission, the Federal Power Commission, and to permittees and licensees of such commissions; and H. R. 14455, to repeal section 9 of the Fish and Wildlife Coordination Act. Testimony was heard from L. C. White, Chairman, FPC; and Frank E. Smith, member of the Board of Directors of TVA.

FISH AND WILDLIFE COORDINATION ACT--ATOMIC ENERGY COMMISSION--FEDERAL POWER COMMISSION: Introduced in House H. R. 14414 (Reuss), Apr. 7, and H. R. 14975 (Ottinger), May 10, 1966, to amend the Fish and Wildlife Coordination Act to make it applicable to the Atomic Energy Commission, and to per-

mittees and licensees of such Commissions; to Committee on Merchant Marine and Fisheries.

S. 3279 (Metcalf) introduced in Senate Apr. 27, 1966, to amend the Fish and Wildlife Coordination Act to make it applicable to the Atomic Energy Commission and to permittees and licensees of such Commission; to Committee on Commerce.

FISHERIES: Sen. Magnuson inserted in Congressional Record, Apr. 19, 1966 (p. 7935), an article which appeared in the Mar. 31, 1966, issue of *Seattle Post-Intelligencer*, titled "Mexicans Complaining of Russian Fishing" by John Chamberlain. Magnuson stated what is needed is some enforceable international convention that will limit and apportion the fishing take in ways that will result in keeping waters from being fished out.

FISHERIES--OREGON: Sen. Morse spoke from the floor of the Senate (Congressional Record, Apr. 13, 1966, pp. 7746-7748), concerning Soviet fishing trawlers that have come into high-sea waters 10 to 30 miles off the coast of Oregon to carry on an extensive fishing expedition. He stated that he thought the U. S. should make representations to the Soviet Government that we would like to proceed with diplomatic negotiations forthwith in an endeavor to see if some understanding can be reached with the Soviet Government in respect to its regulating the fishing practices of its fleet of Russian fishing trawlers on a give-and-take basis. He inserted in the Record a list of conventions that are now in force between the U. S. and other nations, which was supplied by the staff of the Senate Foreign Relations Committee.

FISHING LIMIT OF 12 MILES: Sen. Magnuson inserted in Congressional Record, May 3, 1966 (pp. 9093-9094), a resolution which was adopted Jan. 27, 1966, by the Norwegian Commercial Club, Seattle, Washington. The resolution points out the threat of foreign fishing operations and provides a very thoughtful statement in support of our extended fishery jurisdiction. He stated that the club has also gone on record in support of legislation he introduced (S. 2218) to establish a 12-mile fishery zone off our coast to protect our domestic fishery resources.

Subcommittee on Merchant Marine and Fisheries of Senate Committee on Commerce held hearings May 18, and 19, on S. 2218, to establish a contiguous fishery zone beyond the territorial sea of the United States.

Introduced in House H. R. 14961 (Pelly), May 10, 1966, and H. R. 15011 (Wyatt) May 11, 1966, to establish fishing zones of the United States beyond its territorial seas, and for other purposes; to Committee on Merchant Marine and Fisheries. Rep. Pelly pointed out in Congressional Record, May 10, 1966 (pp. 9760-9761), his bill would provide for a congressional declaration that the fishing zones of the United States will be extended to the edge of the Continental Shelf, or 12 miles, whichever extends further; would provide for a zone somewhat along the lines of Canada's 12-mile fishing zone, except that under this bill the fishing zone would extend the outer boundary to include the Continental Shelf, which is generally defined as 200 meters in depth, or 655 feet. He also listed the following provisions of the bill: (a) Contains provision to assure that this legislation would not conflict with the jurisdiction of any foreign country, whereby the President could set a boundary in substitution if he determined that part of the fishing zone boundary should be changed, (b) Authorizes the State Department, in consultation with the Department of the Interior, to consult with foreign nations to ascertain the extent, manner, and annual

average catch of their fishing boats in any of the affected area, and (c) Allows right to fish in the fishing zone to any foreign nation whose fishermen have established historic fishing rights within such zones during the 10 calendar years preceding the enactment of this law.

FISH PROTEIN CONCENTRATE PLANTS: Introduced in House H. R. 14699 (Keith), Apr. 27, 1966, H. R. 14842 (King of Utah), May 3, and H. R. 14905 (O'Neill of Mass.), May 5, to authorize the Secretary of the Interior to develop, through the use of experiment and demonstration plants, production by the commercial fishing industry of fish protein concentrate; to Committee on Merchant Marine and Fisheries. Rep. Keith spoke in the House and pointed out in Congressional Record, Apr. 27, 1966 (pp. 8731-8732), that the bill differs from other bills that have been filed on the subject inasmuch as it provides that fish protein concentrate will be eligible for distribution under the provisions of the Food for Freedom Act. Other bills referred to Public Law 480 of the 83rd Congress, which is due to expire soon and probably be replaced by the food for freedom program. He further stated that passage of this bill, he believes, will produce a great deal of benefit per tax dollar expended in terms of international good will, improving our balance of payments and boosting our fishing industry.

Hearings scheduled to be heard May 2 and 3, 1966, in Washington, D. C., before the Senate Committee on Commerce on S. 2720, to authorize the Secretary of the Interior to develop, through the use of experiment and demonstration plants, practicable and economic means for the production by the commercial fishing industry of fish protein concentrate, were rescheduled for May 16 and 17.

Rep. Keith in extension of remarks inserted in Congressional Record, Apr. 26, 1966 (p. A2226), an editorial that appeared in the March 31, 1966, edition of the *New Bedford Standard-Times*. He stated that today, fish protein concentrate is awaiting the approval of the Food and Drug Administration. He also stated that there must be no further delay in putting fish protein concentrate to use. Government and industry must both get to work and "sell" fish protein concentrate.

FUR SEAL CONSERVATION AND PRIBILOF ISLANDS ADMINISTRATION: The Senate, May 5, 1966, received H. J. Res. 92 of the Legislature of the State of Alaska, requesting transfer of jurisdiction over the resources of the Pribilof Islands to the State of Alaska. Referred to Committee on Commerce.

INTERIOR DEPARTMENT APPROPRIATIONS FY 1967: Subcommittee of Senate Committee on Appropriations, Apr. 22, 1966, in executive session, approved for full committee consideration, H. R. 14214, a bill making appropriations for the Department of the Interior and related agencies (includes United States fish and Wildlife Service and its two Bureaus: Commercial Fisheries, and Sport Fisheries and Wildlife) for the fiscal year ending June 30, 1967.

Senate Committee on Appropriations, in executive session, May 19, 1966, ordered favorably reported with amendments H. R. 14215, fiscal 1967 appropriations for the Department of the Interior, and related agencies. As approved by the committee the bill would provide a total of \$1,329,755,000, an increase of \$34,585,500 over the House-passed figure of \$1,295,169,500.

NATIONAL SEA GRANT COLLEGES AND PROGRAM ACT OF 1965: Introduced in House H. R. 14460 (Hathaway), H. R. 14462 (Huot), Apr. 19, 1966, and H. R. 14873 (Keith), May 4, to amend the National Science Foundation Act of 1950, as amended, so as to authorize the establishment and operation of sea-grant colleges and programs by initiating and supporting programs of education, training, and research in the marine sciences and a program of advisory services relating to activities in the marine sciences, to facilitate the use of the submerged lands of the Outer Continental Shelf by participants carrying out these programs, and for other purposes; to Committee on Science and Astronautics.

Rep. Keith in extension of his remarks stated that the idea of the bill is analogous to the land-grant college concept, and his belief is that such a program would create the same rapid growth in marine sciences that the land-grant college provided for agriculture. Rep. Keith stated that this bill would, among other things, meet three of the most pressing needs of our oceanographic program--applied research, dissemination of information to users, and provision of more personnel, especially ocean technicians.

The Special Subcommittee on Sea Grant Colleges of Senate Committee on Labor and Public Welfare held hearings on May 3, 1966, on S. 2439, to amend the National Science Foundation Act of 1950, as amended, so as to authorize the establishment and operation of sea grant colleges and programs by initiating and supporting programs of education, training, and research in the marine sciences and a program of advisory services, to facilitate the use of submerged lands of the Outer Continental Shelf by participants carrying out these programs, and for other purposes.

NATIONAL WATER COMMISSION ACT: Sen. Jackson in *Congressional Record*, Apr. 18, 1966 (p. 7837), announced that the Senate Interior and Insular Affairs Committee conducted open public hearings on May 9 and 10 on S. 3107, to create a National Water Commission. This legislation proposed by the Administration, would establish an independent, seven-member Commission of distinguished Americans outside the Federal Government who would study and advise the President and the Water Resources Council on the entire range of water problems.

OCEANOGRAPHIC AGENCY OR COUNCIL: House Apr. 19, 1966, insisted on its amendments to S. 944, to provide for expanded research and development in the marine environment of the United States, to establish a National Council on Marine Resources and Engineering Development, and a Commission on Marine Science, Engineering, and Resources; agreed to a conference with the Senate; and appointed conferees.

Conferees Apr. 28, 1966, and May 2, met in executive session to resolve the differences between the Senate- and House-passed versions of S. 944, but did not reach final agreement, and recessed subject to call.

OCEANOGRAPHY: Sen. Murphy spoke in the Senate (*Congressional Record*, Apr. 18, 1966, p. 7866) and called attention to the Mar. 25, 1966, dedication ceremony by the University of California's Board of Regents when it named a new oceanographic research facility on Point Loma, off San Diego, after the late Fleet Adm. Chester W. Nimitz. He stated that the 6-acre, \$1 million facility is considered to be one of the most advanced installations in the world for the study of the sea and the distribution of plant and aquatic ani-

mal life; and will be operated by the Scripps Institute of Oceanography. He further stated that this facility will be the home port for many research and training vessels, which already include the *Alpha-Heliz*, an ocean-going biological laboratory, and the *Thomas Washington*, a research vessel. The Senator inserted in the *Record* an article which appeared in the March 28, 1966, edition of the *San Diego Union* titled "Carrier for Nimitz."

Rep. Downing spoke in the House and inserted in *Congressional Record*, May 4, 1966 (pp. 9385-9387), a speech which was recently presented by Vice Adm. John S. McCain, Jr., U. S. Navy, representative and vice chairman, U. S. delegation, United Nations Military Staff Committee, U. S. Mission to the United Nations, at the U. S. Merchant Marine Academy at Kings Point, New York, titled "The Total Wet War." The speech emphasized the Naval aspects of the oceans, the merchant marine, oceanography, and fishing industry.

OYSTER PLANTERS LOAN: S. 3320 (Williams of N. J.) introduced in Senate May 5, 1966, to extend the benefits of the Consolidated Farmers Home Administration Act to oyster planters; to Committee on Agriculture and Forestry.

PLANNING-PROGRAMMING-BUDGETING SYSTEM: Sen. Proxmire inserted in *Congressional Record*, Apr. 28, 1966 (pp. 8886-8887), an article from the Apr. 28 *Wall Street Journal* titled "New-Look Budget?--U. S. Agencies Now Will Weigh Program Costs Against Likely Benefits--White House Further Orders Investigation of Alternative Ways To Reach Same Ends--First Reports Next Week," by Alan L. Otten. Sen. Proxmire pointed out that this new system would give the President and his agency heads a series of advantages in achieving greater efficiency and economy.

SOVIET FISHING TRAWLERS OFF THE PACIFIC COAST: Sen. Morse spoke from the floor of the Senate in a continuation of his discussion of Apr. 13, relative to the huge catches of bottomfish being taken by Soviet trawlers in the deep waters from 10 to 30 miles off the coast of Oregon. He inserted in *Congressional Record*, Apr. 25, 1966 (pp. 8488-8491), a letter dated Apr. 19 from the State Department, in reply to his letter of Apr. 13, requesting that the Department take immediate action, through diplomatic channels, to work out a satisfactory policy which would assure proper conservation measures with respect to the fishery resource. He also inserted in the *Record* the text of his letter of Apr. 25, 1966, to Donald L. McKernan, Director of the Bureau of Commercial Fisheries, U. S. Department of the Interior, requesting the Bureau to supply relevant information concerning this coastal fishery in order that all available facts will be on hand.

Rep. Wyatt inserted in *Congressional Record*, Apr. 27, 1966 (p. A2272), his two letters of Apr. 22, to President Johnson and Rep. Dingell, chairman of our Fisheries and Wildlife Conservation Subcommittee. Rep. Wyatt stated that Russian fishing activity off Pacific coastal areas has reached such magnitude and intensity it must be halted unless our fishery resource there is irretrievably damaged. This is more than a sectional problem--it affects our entire country.

Rep. Wyatt in extension of his remarks inserted in *Congressional Record*, May 2, 1966 (pp. A2343-A2344), two resolutions which were adopted on Apr. 21, 1966, by the Congress of American Fishermen concerning the

Soviet Union fishing vessels off the Oregon-Washington coasts which pose a severe threat to resources and existing fisheries of the United States. It was proposed that one of the resolutions be presented to the U. S. Senate Commerce Committee hearing on S. 2218, as an amendment to the 12-mile jurisdiction provided in that proposed legislation.

STATE DEPARTMENT--SPECIAL ASSISTANCE FOR FISHERIES AND WILDLIFE: Sen. Tower spoke in the Senate (Congressional Record, May 3, 1966, p. 9107), concerning the valuable services which are performed by the Office of the Special Assistance for Fisheries and Wildlife in the Department of State on problems which may arise between the Texas shrimp industry and that of other countries. He inserted in the Record a letter he wrote to Sen. Magnuson, Apr. 29, in support of a proposal to upgrade the status of the above-mentioned Office.

SUPPLEMENTAL APPROPRIATIONS FY 1966 (2nd): The Senate Committee on Appropriations, Apr. 25, 1966, in executive session marked up and ordered favorably reported with amendments H. R. 14012, second supplemental appropriations for fiscal year 1966. Includes additional funds for the Office of the Commissioner of Fish and Wildlife and the Bureau of Commercial Fisheries.

Under prior authority the Senate Apr. 25, 1966, reported (S. Rept. 1137) on H. R. 14012. On Apr. 27, Senate passed H. R. 14012, with amendments; insisted on its amendments; asked for a conference with House and appointed conferees.

S. Rept. 1137, The Second Supplemental Appropriation Bill, 1966 (Apr. 25, 1966, report from the Committee on Appropriations, U. S. Senate, 89th Congress, 2nd session, to accompany H. R. 14012), 40 pp., printed.

Second Supplemental Appropriation Bill, Fiscal Year 1966: Hearings before the Committee on Appropriations, United States Senate, 89th Congress, 2nd session, 635 pp., printed. Includes testimony, statements, and exhibits on additional funds for the Bureau of Commercial Fisheries and the Bureau of Sport Fisheries and Wildlife.

House May 3, 1966, disagreed to Senate amendments to H. R. 14012, making supplemental appropriations for the fiscal year June 30, 1966; agreed to a conference with the Senate; and appointed conferees.

Conferees, in executive session, May 5, 1966, agreed to file a conference report (H. Rept. 1476) on the differences between the Senate- and House-passed versions of H. R. 14012, second supplemental appropriations for fiscal year 1966. The conferees allowed (Amendment No. 15) \$148,000 for "Management and Investigations of Resources, Bureau of Commercial Fisheries," as proposed by the House instead of \$193,000 as proposed by the Senate.

The Senate May 10, 1966, adopted the conference report on H. R. 14012, making supplemental appropriations for fiscal year ending June 30, 1966; and concurred in the House amendments. This action cleared the bill for the President's signature.

WATER POLLUTION CONTROL: Subcommittee on Air and Water Pollution of Senate Committee on Public Works Apr. 20, 1966, continued its series of hearings on several pending bills proposing various amendments to the Federal water pollution control laws, having as its witnesses John W. Gardner, Secretary, and James N. Quigley, Assistant Secretary, both of the Department of HEW; and Stewart L. Udall, Secretary of the Interior.

WATER POLLUTION CONTROL ACT AMENDMENT: S. 3225 (Tydings) introduced in Senate Apr. 14, 1966, to provide that plans and regulations established pursuant to section 10 of the Federal Water Pollution Control Act for the control of water pollution shall apply to vessels (including boats) and marinas. Sen. Tydings spoke in the Senate and pointed out in Congressional Record, Apr. 14, 1966 (p. 7801), that bill would provide that the standards that the States adopt pursuant to the Water Quality Act apply to maritime pollution, as well as to the more familiar problems of municipal and industrial pollution.

WATER POLLUTION IN U. S. NAVIGABLE WATERS: H. R. 14499 (Vanik) introduced in House Apr. 19, 1966, to expand and improve existing law and to provide for the establishment of regulations for the purpose of controlling pollution from vessels and certain other sources in the Great Lakes and other navigable waters of the United States; to Committee on Merchant Marine and Fisheries.

WATER RESOURCES PROPOSALS--FEASIBILITY INVESTIGATIONS: Subcommittee on Irrigation and Reclamation of House Committee on Interior and Insular Affairs Apr. 28, 1966, held a hearing on H. R. 13419, to authorize the Secretary of the Interior to engage in feasibility investigations of certain water resource development proposals. Testimony was heard from officials of the Department of the Interior.

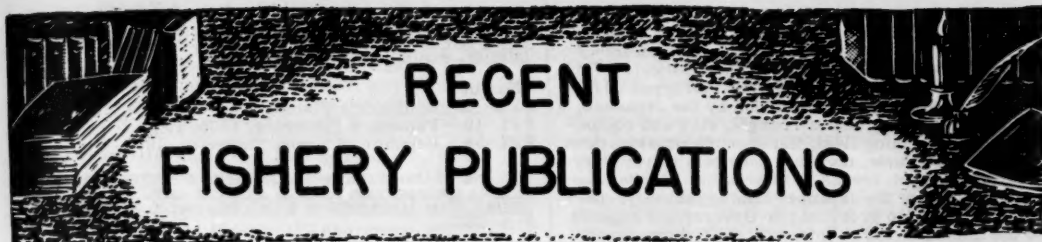
WATER RESOURCES RESEARCH: S. 22, an act to promote a more adequate program of water research was signed by the President on Apr. 19, 1966 (P. L. 89-404).

WORLD HUNGER: House Committee on Agriculture May 5, 1966, met in executive session and approved Committee Print No. 5 on H. R. 12785 (proposed Food for Freedom Act of 1966), to promote international trade in agricultural commodities to combat hunger and malnutrition and to further economic development, a clean bill to be introduced.

H. R. 14929 (Cooley), H. R. 14939 (Matsunaga), and H. R. 14945 (Springer) introduced in House May 9, 1966, to promote international trade in agricultural commodities, to combat hunger and malnutrition, to further economic development, and for other purposes; to Committee on Agriculture.

Note: REPORT ON FISHERY ACTIONS IN 89TH CONGRESS: The U. S. Department of Interior's Bureau of Commercial Fisheries has issued a leaflet on the status of most legislation of interest to commercial fisheries at the end of the 1st session of the 89th Congress. For copies of MNL-3 "Legislative Actions Affecting Commercial Fisheries, 89th Congress, 1st Session 1965," write to the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Rm. 510, Arlington, Va. 22209.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20402. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
FFL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- | Number | Title |
|----------|--|
| CFS-3935 | - Michigan, Ohio & Wisconsin Landings, October 1965, 4 pp. |
| CFS-4044 | - Gulf Coast Shrimp Data, October 1965, 19 pp. |
| CFS-4048 | - Michigan, Ohio & Wisconsin Landings, November 1965, 4 pp. |
| CFS-4066 | - Gulf Coast Shrimp Data, November 1965, 18 pp. |
| CFS-4071 | - New Jersey Landings, January 1966, 3 pp. |
| CFS-4078 | - Michigan, Ohio & Wisconsin Landings, December 1965, 4 pp. |
| CFS-4082 | - Massachusetts Landings, December 1965, 9 pp. |
| CFS-4083 | - Shrimp Landings, December 1965, 5 pp. |
| CFS-4084 | - Gulf Coast Shrimp Data, December 1965, 16 pp. |
| CFS-4085 | - New York Landings, January 1966, 4 pp. |
| CFS-4086 | - Texas Landings, January 1966, 2 pp. |
| CFS-4090 | - Alabama Landings, January 1966, 2 pp. |
| CFS-4092 | - Florida Landings, February 1966, 8 pp. |
| CFS-4094 | - Fish Meal and Oil, February 1966, 2 pp. |
| CFS-4095 | - Michigan, Ohio & Wisconsin Landings, January 1966, 3 pp. |
| CFS-4098 | - United States Fisheries, 1964 Annual Summary, 17 pp. |
| CFS-4099 | - Louisiana Landings, January 1966, 3 pp. |
| CFS-4101 | - California Landings, January 1966, 4 pp. |
| CFS-4100 | - <u>Fisheries of the United States, 1965</u> , by Charles H. Lyles, 81 pp., illus., Mar. 1966. This report presents detailed information on the United States catch of fish and shellfish, production of manufactured fishery commodities, foreign trade in aquatic products, and supplies of selected fishery items (domestic production plus imports). Data in the report show that the catch in 1965 amounted to 4,722 million pounds worth \$451 million ex-vessel--the highest dollar value in our history. The volume taken was 181 million pounds or 4 percent more than in 1964. The value increased \$61 million (or 16 percent), and the average price of 9.5 cents per pound was the highest ever recorded. Shrimp was |

the most valuable item taken by domestic fishermen in 1965, accounting for 18.2 percent of the total paid for all species. The amount of \$82.1 million was paid for shrimp. That was 22 percent more than for the second most valuable item--Pacific salmon. Blue crab, flounder, king crab, and lobster catches were all higher than in 1964. The pack of canned fishery products in the United States, American Samoa, and Puerto Rico was 38.3 million standard cases (1.1 billion pounds) valued at \$484.1 million to the packers. Compared with the pack in 1964, production increased by 2.6 million cases and \$47.4 million. The gain in production was mainly from a record pack of tuna, and increases in packs of Maine sardines, clam products, animal food, and shrimp. Packs of salmon, mackerel, Pacific sardines, and oysters were smaller. Production of fresh and frozen packaged fish fillets and steaks (excluding Alaska and Hawaii) was 167.5 million pounds valued at \$65.5 million. Production of industrial fishery products was valued at \$81.9 million--an increase of \$11.9 million over 1964. Marine animal scrap and meal amounted to 253,371 tons, marine animal oil 195.6 million pounds, and fish solubles 98,017 tons. Products from oyster shells and buttons from freshwater and marine mollusk shells were valued at \$5.7 million, a decrease of \$490,000 from the previous year. Other industrial items in 1965 included agar-agar, fish feed pellets, animal feeds, Irish moss extracts and stabilizers, kelp products, fish leather, fish fins, liquid and dry fertilizer, pearl essence and novelties, colored chips, and crab shells valued at \$20.1 million. Production of fish sticks and portions was 221.1 million pounds valued at \$91.4 million.

Sep. No. 762 - The Atlantic Tuna Fisheries, 1963.

Sep. No. 763 - Pacific Hake (*Merluccius productus*) as Raw Material for a Fish Reduction Industry.

FL-586 - Commercial Flounder Giggling, by Hilton M. Floyd, 8 pp., illus., Feb. 1966. Describes a commercial method of spearing southern flounder (*Paralichthys lethostigma*), and the gear used. The essential equipment is a spear and a light.

The Fisheries of Chile, by Sidney Shapiro, Circular 234, 18 pp., illus., Nov. 1965. Trends and developments in the Chilean fisheries are discussed, with special emphasis given to the expanding fish-reduction industry. Within a few years Chile has become one of the world's largest producers and exporters of fish meal and oil. Information is also presented on other exportable products, mainly shrimp and plated lobster (langostino), and on segments of the industry that produce for domestic consumption.

The Fisheries of Japan, by Sidney Shapiro, Circular No. 233, 28 pp., illus., Nov. 1965. Trends, developments, and statistical data are presented on important aspects of Japan's worldwide fisheries. Included are discussions of the principal types of fish and other aquatic products landed by the Japanese, areas in which species are caught, size and composition of the fishing fleet, fishermen's organizations, marketing methods, the main uses to which fishery products are put, trends in international trade, and the structure of the Japanese fishing industry. Information is also presented on Government support to the fisheries and on international fishery agreements to which Japan is a party.

The Fisheries of Norway, by Sidney Shapiro, Circular 235, 22 pp., illus., Nov. 1965. This report presents trends and developments in the Norwegian fisheries, the largest in Europe, excluding those of the U.S.S.R. Since domestic consumption uses only about one-eighth of fishery landings, the Norwegian fishing industry is dependent on maintaining a large export trade. The industry has encountered difficulties because of declining landings of cod and winter herring and because of competition in foreign markets. The Norwegian Government has committed itself to a policy of supporting fishermen's incomes so that they are on a level with the general wage level of the country. Support to the industry consists of subsidies, loans, and programs to modernize vessels, processing plants, and other facilities.

Progress in 1964-65 at the Bureau of Commercial Fisheries Biological Laboratory, Honolulu, by Thomas A. Manar, Circular 243, 42 pp., illus., printed, Feb. 1966. This report deals with research results achieved by the Bureau of Commercial Fisheries Biological Laboratory in Honolulu from Jan. 1, 1964 to June 30, 1965. Described are developments in the following fields: the sensory capacities of tuna; tuna behavior; subpopulations research using genetic techniques; studies of the ecology of the skipjack tuna and the albacore tuna; biological surveys of the Indian Ocean; investigations of the oceanography of the Hawaiian Islands area and of the entire Pacific; and studies devoted to the evaluation of the use of a submarine for research in fisheries and oceanography. Publications issued or in press during the period are listed.

Shark Fishing Gear: A Historical Review, by Mary Hayes Wagner, Circular 238, 17 pp., illus., Jan. 1966. In this account the descriptions of shark fishing and gear and accessory equipment, and suggestions for fishing methods and bait, are simplified and basic. The gear used for the capture of large sharks is the primary concern of this report. Small sharks that travel in schools are easily caught in large numbers by other trawls. The author points out that "Fishing methods must be adapted to the fishing locality. Weather and sea conditions affect the choice of the vessel and limit the kinds of gear that are practical. Other factors that determine the gear are: the nature of the bottom in the fishing area; the species and abundance of sharks available; local costs of gear and labor; and the value of the products at the point of sale. It is not possible to develop general rules for shark fishing because each situation demands trial and error in the selection of the appropriate gear and method."

THE FOLLOWING FOREIGN FISHERY LEAFLETS (FORMERLY MARKET NEWS LEAFLETS) ARE AVAILABLE FROM THE BRANCH OF FOREIGN FISHERIES, BUREAU OF COMMERCIAL FISHERIES, ROOM 5013, U. S. DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. 20240:

Number	Title
FFL-5	Denmark's Fishing Industry, 1964, 10 pp.
FFL-18	Panama's Fisheries, 1965, 10 pp.
FFL-58	Republic of Korea Fisheries, 1964, 4 pp.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES, ICHTHYOLOGICAL LABORATORY, U. S. NATIONAL MUSEUM, WASHINGTON, D. C. 20560:

Taxonomic Study of the Tunas, by T. Iwai, I. Nakamura, and K. Matsubara, Translation No. 38, 73 pp., processed, 1965. (Translated from the Japanese by Chufa Tasi.) This translation is intended to be an aid to the use of the original; the figures have not been reproduced.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fisheries, 1965 (Preliminary), by L. A. Keilman, 24 pp., April 1966. (Fishery Market News Service, U. S. Fish and Wildlife Service, Rm. 205, P. O. Bldg., San Pedro, Calif. 90731.) Contains a brief review of major fisheries developments during 1965. Includes statistical data for 1965 with comparisons on canners' receipts and pack of tuna, tunalike fish, Pacific and jack mackerel, and miscellaneous fishery products. Also includes data on landings and canned pack of sardines, meal and oil production; cold-storage holdings of fish and shellfish; landings of market fish and shellfish; imports of fishery products into Arizona and California Customs Districts; and California whale fisheries 1963-65.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, March 1966, 14 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, March 1966, 8 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego, Calif. 92106.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

Fishery Industrial Research, vol. 3, no. 1, Dec. 1965, 53 pp., illus., printed. (Branch of Reports, U. S. Bureau of Commercial Fisheries, 2725 Montlake Blvd., Seattle, Wash. 98102.) Contains articles on: "Occurrence of pomfret (*Brama japonica*) in the Northeastern Pacific Ocean," by Charles R. Hitz and Robert R. French; "Author index of publications and addresses-1964, Bureau of Commercial Fisheries, Branches of Economics and Technology, and the Branch of Reports, Seattle," by Helen E. Plastino and Mary S. Fukuyama; "Influence of temperature on the fatty acid pattern of muscle and organ lipids of the rain-

bow trout (*Salmo gairdneri*)," by Werner G. Knipp-rath and James F. Mead; "Costs and earnings of tropical tuna vessels based in California," by Roger E. Green and Gordon C. Broadhead; and "Amino acid composition of the alewife (*Alosa pseudoharengus*)," by Mary H. Thompson and Robert N. Farragut.

Inhibition of Unicellular Algae by Synthetic Surface-Active Agents, by Ravenna Ukeles, 9 pp., illus., printed. (Reprinted from *Journal of Phycology*, vol. 1, no. 3, 1965, pp. 102-110.) U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, February and March 1966, 4 pp. each. (Market News Service, U. S. Fish and Wildlife Service, P. O. Box 447, Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the months indicated.

Receipts and Prices of Fresh and Frozen Fishery Products at Chicago, 1965 (Preliminary), 49 pp., April 1966. (Fishery Market News Service, U. S. Fish and Wildlife Service, Rm. 704, 610 S. Canal St., Chicago, Ill. 60607.) Contains statistical tables on receipts of fish and shellfish at Chicago wholesale market by species, states and provinces, and by months; wholesale market price ranges by months for fresh-water fish, frozen fillets, and other frozen fish and shellfish.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, March 1966, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 New Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes landings by the halibut fleet reported by the Seattle Halibut Exchange; salmon fleets reported by primary receivers; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels; receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district for the month indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

BACTERIOLOGY:

Articles from Chemical Abstracts, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006:

"The marine bacteria. I - Comparative observations on the inorganic salt requirements of marine and terrestrial bacteria," by Tomio Hidaka, vol. 62, Apr. 26, 1965, Abstract No. 108630.

"Marine bacteriology and the problem of mineralization," by Sydney C. Rittenberg, vol. 63, Aug. 2, 1965, Abstract No. 3327d.

"Phospholipids of nervous system in vertebrates and invertebrates," by E. M. Kreps and others, vol. 60, Apr. 13, 1964, Abstract No. 9652b.

BOTULISM:

Sixty-five Years of Human Botulism in the United States and Canada (Epidemiology and Tabulations of Reported Cases, 1899 Through 1964), by K. F. Meyer and B. Eddie, 76 pp., June 1965. University of California Printing Department, University of California, Berkeley, Calif. 94720.

BRAZIL:

The following publications are available from Grupo Coordenador do Desenvolvimento da Pesca (GCDP), Sudene, Cais de Santa Rita, Edif. Entrepotado Fed. Pesca, Recife, Pernambuco, Brazil:

"Glossário de nomes de peixes; português, inglês, sistemático" (Glossary of Fish Names; Portuguese, English, and Scientific), by J. M. Brandao, articles, Boletim de Estudos de Pesca, vol. 4, no. 4, July-August 1964, pp. 7-40; vol. 4, no. 5, September-October 1964, pp. 7-59; vol. 4, no. 6, November-December 1964, pp. 7-59; printed in Portuguese.

A pesca em Pernambuco" (The fishery in Pernambuco), by Osiris Lira, article, Boletim de Estudos de Pesca, vol. 4, no. 2, March-April 1964, pp. 9-14, printed in Portuguese.

CANADA:

Annual Review, Fisheries Council of Canada, 1966, 104 pp., illus., printed, 1966. Fisheries Council of Canada, 77 Metcalfe St., Ottawa 4, Canada. This Review covers the Canadian fishing industry in great depth. It is an authoritative reference manual providing a broad picture of the fishing industry in its editorial columns. Among others, contains these articles: "Science in the service of an industry," by F. R. Hayes; "Fisheries industrial development," by J. Kinloch; "Voluntary versus mandatory inspection in the seafoods industry," by H. E. Crowther; "Modern development of the Japanese fishing industry," by Norio Fujinami; "Planning for greater food production," by David F. Corney; "Canada's sea fisheries in 1965," by A. Proulx; "Automation on trawlers," by Conrad Birkhoff.

Atlantic Salt Fish Commission Report (established by Order in Council dated Oct. 29, 1964, P.C. 1964-1672), 170 pp., illus., processed. Department of Trade and Commerce, St. John's, Newfoundland, Canada. This Report was prepared by the Atlantic Salt Fish Commission established Oct. 29, 1964, to study the Atlantic salt-fish industry and the advisability of establishing a National Salt Fish Marketing Board. The Commission concluded that the problems of the salt-fish industry were in the area of production and quality rather than in marketing. The Commission recommended: (1) that a National Salt Fish Marketing Board not be established; (2) that the manufacturing of salt fish be taken out of the hands of fishermen; (3) that a manufacturing

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agency be established for the primary purpose of salting fish; (4) that these products be offered for sale by auction or by tender to Canadian exporters; (5) that efforts of the Government to reduce the number of inshore fishermen through training and migration assistance be encouraged; (6) that more care be taken by Government in choosing the types of assistance given to primary producers; and (7) that nothing be done in accomplishing these ends that will prejudice the expansion of the freezing industry.

The Report includes chapters on: (1) The Problem and Measures Towards its Solution; (2) Historical Development of the Atlantic Coast Fishery; (3) The World Fishery; (4) Canada's Position in the World Fishery; (5) The Primary Fishing Industry; (6) the Salt Fish Processing Industry of the Atlantic Provinces and Quebec; (7) Frozen Fish or Salted Fish--Some Economic Considerations; and (8) Factors Which Inhibit Economic Development in the Fisheries. Appendices with tables are included.

British Columbia Catch Statistics, 1965 (by Area and Type of Gear), 205 pp., illus., processed, Feb. 4, 1966. Economics Branch, Department of Fisheries of Canada, 1155 Robson Street, Vancouver 5, B. C., Canada. The fifteenth annual report of catch statistics for British Columbia based on Departmental copies of sales slips that are completed by all commercial fish buyers operating within the Province. The report is divided into three sections: (1) summary of landings and landed values by district; (2) highlights of catch statistics--a general review of significant events in the salmon fishery and a review for other species; and (3) detailed district and area statistics by type of gear. Landings of halibut at U. S. ports by Canadian fishermen are included in area and summary totals.

The Canadian Fish Culturist, issue 35, Oct. 1965, 72 pp., illus., printed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Among the articles included are: "Water Pollution and Fish Populations in the Province of Newfoundland and Labrador in 1964," by V. R. Taylor; and "Fisheries Problems Associated with Hydroelectric Development," by R. N. Gordon.

CHEMICAL COMPOSITION:

Articles from Chemical Abstracts, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006:

"Blood chemical composition of the carp and sazan," by I. D. Golovats'kii, B. S. Avdov'sev, and Z. P. Nazarkevich, vol. 59, Aug. 19, 1963, Abstract No. 4304b.

"The effect of temperature on the fatty acid composition of the crustacean plankton," by Tibor Farkas and Sandor Herodek, vol. 61, July 6, 1964, Abstract No. 1007f.

"Fatty acid composition of mackerel, shad, and sardine oils," by Antonio Montefredine and Concetta Testa, vol. 63, Aug. 2, 1965, Abstract No. 3177c.

"The lipids of flounder. I--Acetone-soluble lipids from flounder muscle," by Hisanao Igarashi and others, vol. 60, Mar. 16, 1964, Abstract No. 7190f.

"Studies on the fatty acid composition of crayfish lipids," by D. A. Wolfe, article, Journal of the American Oil Chemists Society, vol. 42, July 1965, pp. 633-637, printed. American Oil Chemists' Society, 35 E. Wacker Dr., Chicago, Ill. 60606.

CHESAPEAKE BAY:

Chesapeake Science, vol. 7, no. 1, Mar. 1966, 58 pp., illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md. Includes, among others, these articles: "Osmoregulation in the adult blue crab, *Callinectes sapidus* Rathbun," by Eng-Chow Tan and W. A. Van Engel; and "Tolerances of several marine species to Co 60 irradiation," by John C. White, Jr., and Joseph W. Angelovic.

COD:

"The use of sodium dodecyl sulphate in the study of protein interactions during the storage of cod flesh at -14°," by J. J. Connell, article, Journal of the Science of Food and Agriculture, vol. 16, no. 12, December 1965, pp. 769-783, illus., printed, single issue £1 17s. 6d. (US\$5.25). Society of Chemical Industry, 14 Belgrave Square, London, S.W.1, England.

COD LIVERS:

"Free fatty acid formation in cod livers sterilized by irradiation," by R. G. Ackman, J. E. Stewart and H. E. Power, article, Journal of the Fisheries Research Board of Canada, vol. 23, no. 1, January 1966, pp. 155-156, printed, single issue C\$1.00. Issued by Fisheries Research Board of Canada, Ottawa, Ontario, Canada. (Sold by Queen's Printer, Ottawa.)

CRAB:

The Alaskan King Crab Industry, 8 pp., printed. (Reprinted from Alaska Review of Business and Economic Conditions, vol. II, no. 5, Nov. 1965.) Institute of Business, Economic and Government Research, University of Alaska, College, Alaska 99735.

"Proximate composition of Chesapeake Bay blue crab (*Callinectes sapidus*)," by Robert N. Farragut, article, Journal of Food Science, vol. 39, May-June 1966, pp. 538-544, printed. Journal of Food Science, 510-524 North Hickory St., Champaign, Ill. 61820.

FILM STRIPS:

Understanding Oceanography, consists of 6 film strips, three 33½ r.p.m. records, 6 Teacher's Guides, complete set \$42.50, each filmstrip with record guide \$9.50. (Recommended for procurement under federally funded education programs, grade level: Jr.-Sr. High.) Society of Visual Education, Inc., 1345 Diversey Parkway, Chicago, Ill. 60614. The latest information about recent developments and discoveries in oceanography (not yet included in most textbooks) is provided in this informative series of full-color filmstrips. Challenges that oceanographers face today are dramatically presented. How can oceanography unlock the secret of earth's past? How can the sea's abundance be utilized for food and natural resources for the growing world population? This series also describes various forms of marine life, ocean currents and tides, and other phenomena peculiar to the sea. The films are titled: "The study of oceans," "The ocean basins," "Characteristics of seawater," "Currents, waves, and tides," "Life of the open seas," and "Life of the sea floor and shore."

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FISH BONE DETECTOR:

"Prototype automatic fish-bone detector," by James M. Moran and others, article, *Food Technology*, vol. 19, May 1965, pp. 46-51, printed, Institute of Food Technologists, Suite 1350, 176 N. Adams St., Chicago, Ill. 60603.

FISHING:

Fish Catching Methods of the World, by Andres von Brandt, 215 pp., illus., printed, 1964, \$12.50. Fishing News (Books) Ltd., 110 Fleet Street, London EC4, England. Some of the chapters discuss development of fishing gear; spearing and shooting of fish; line fishing with and without hook; attracting, concentrating and frightening the fish; mechanical traps and snares; barriers; from the fish basket to the pound net; art of net making; beach and boat seines; from the rake to the mussel dredge; from the beam trawl to the otter trawl; trawl fishery in three dimensions; dip nets, lift nets and fish wheels; visible and invisible gill nets; and elements of fishing gear construction. Included is an adequate bibliography, an appendix with a classification system for gear, and an index.

--Joseph Pileggi

FISH MEAL:

"Nutritive value and analytical characteristics of new and up-to-12 years old herringmeals," by B. Laksevela and Anna T. Aga, article, *Journal of the Science of Food and Agriculture*, vol. 16, no. 12, December 1965, pp. 743-749, illus., printed, single issue £1 17s. 6d. (US\$5.25). Society of Chemical Industry, 14 Belgrave Square, London, S.W.1, England.

"Two methods of evaluating fish meal proteins by chick growth," by H. R. Bird and others, article, *Poultry Science*, vol. 44, May 1965, pp. 865-868, printed. Poultry Science Association, Kansas State University, Manhattan, Kan. 66504.

FISH OIL:

"Decomposition of cod livers and the formation of free fatty acids in cod oil," by P. M. Jangaard and H. E. Power, article, *Journal of the Fisheries Research Board of Canada*, vol. 23, no. 1, January 1966, pp. 21-25, printed, single issue C\$1.00. Issued by Fisheries Research Board of Canada, Ottawa, Ontario, Canada. (Sold by Queen's Printer, Ottawa.)

"Red perch and soybean oils," by A. Fricker, article, *Chemical Abstracts*, vol. 61, Sept. 28, 1964, Abstract No. 8532h, printed. American Chemical Society, 1155 16th Street NW., Washington, D. C. 20006.

FOOD AND AGRICULTURE ORGANIZATION:

Indo-Pacific Fisheries Council Proceedings, 11th Session, Kuala Lumpur, Malaysia, 16-31 October 1964, Section III "Symposium on Increasing Fish Consumption through Improved Handling and Distribution," 383 pp., processed in English, 1965, US\$1. IPFC Secretariat, FAO Regional Office for Asia and the Far East, Bangkok, Thailand, 1965. (Sold by Publications Section, FAO, Via delle Terme di Caracalla, Rome, Italy.) The full proceedings of this session of the Council consists of three sections.

A total of 37 papers were contributed to the Symposium of which 27 were experience and research papers from within the Indo-Pacific Region and 10 were from outside the Region prepared by specialists on selected subjects of interest to the Region. The papers reproduced in this section have been classified into the following subject groups: "Technology and Economics of Ice Production and Use"; "Handling and Icing Fresh Fish Aboard and Onshore"; "Use of Chilled Sea Water and Sea Water Ice"; "Use of Preservatives Such as Antibiotics, Species"; "Cold Storage, Transport, Containers and Other Distribution Facilities"; "Marketing, Cooperatives"; "Inspection and Quality Control"; "Consumer Education"; and "Role of Government."

FREEZE DRYING:

"An engineer looks at the kinetics and cost of food freeze-drying," by James W. Ryan, article, *Food Technology*, vol. 19, Apr. 1965, pp. 49-51, printed. Institute of Food Technologists, Suite 1350, 176 N. Adams St., Chicago, Ill. 60603.

"Freeze drying of fish," by Walter Pichel, article, *ASHRAE Journal*, vol. 7, Oct. 1965, pp. 72-73, printed. American Society of Heating, Refrigerating and Air-Conditioning Engineers, 62 Worth St., New York, N. Y. 10013.

FREEZING:

"Packing company scores again: Starts liquid nitrogen freezing," article, *Fishing Gazette*, vol. 82, Apr. 1965, pp. 44-45, 49, 114-115, printed. Fishing Gazette Publishing Corp., 461 Eighth Ave., New York, N. Y. 10001.

FROZEN FISH:

"Application of antioxidants in improving the shelf life of frozen fish," by I. A. Shishkanova, N. V. Chermenko, and A. M. Kamaletdinova, article, *Chemical Abstracts*, vol. 63, Nov. 8, 1965, Abstract No. 13940d, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Protein denaturation of frozen fish. Comparison between super rapid freezing by liquid nitrogen (-196°) and air (-20°) freezing," by T. Suzuki, K. Kanna, and T. Tanaka, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 30, 1965, pp. 1022-1036, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

FROZEN STORAGE:

"Growing import-export FF trade impels zero warehouse building at ports," article, *Quick Frozen Foods*, vol. 27, May 1965, pp. 119-120, 122, 124, printed. E. W. Williams Publications, Inc., 1776 Broadway, New York, N. Y. 10019.

INDIA:

"Canning of seer fish," article, *Indian Seafoods*, vol. III, no. 2, 1965, pp. 7-8, illus., printed in English. The Marine Products Export Promotion Council, Mahatma Gandhi Road, Ernakulam-6, Kerala State, India.

IRRADIATION PRESERVATION:

Abstracts from *Technical Abstracts Bulletin*, Oct. 1, 1965, printed, 50 cents a copy. Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Springfield Va. 22151:

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Development of Irradiation Sterilized Shelf-Stable Fish and Seafood Products, by R. O. Sinnhuber and H. W. Schultz, TAB65-20, Abstract No. AD-620-675, p. 23.

Development of Radiation Sterilized Fish Items for Armed Forces Feeding, by R. O. Sinnhuber, TAB 65-19, Abstract No. AD-619-446, p. 18.

"Physiological changes induced by gamma irradiation of bacteria from shrimp," by Joseph A. Liuzzo, Arthur F. Novak, and Jesse R. Ortego, article, *Journal of Food Science*, vol. 30, July-August 1965, pp. 710-713, printed, Institute of Food Technology, Suite 1350, 176 N. Adams St., Chicago, Ill. 60603.

IVORY COAST:

"Evolution de la peche maritime en Cote-d'Ivoire de 1960 a 1965" (Development of marine fisheries in Ivory Coast from 1960 to 1965), by J. M. Bessetaux, article, *La Peche Maritime*, vol. 45, no. 1056, March 1966, pp. 163-164, illus., printed in French, single issue 15 F (US\$3). Les Editions Maritimes, 190, Boulevard Haussmann, Paris, France.

JAPAN:

Ocean Fisheries (a special issue of this quarterly journal featuring Japan's advances in fishing and fishery technology), vol. 2, no. 2, April 1966, 44 pp., illus., printed, subscription \$3.00 for 1 year. Ocean Fisheries, Circulation Department, 500 Howard Street, San Francisco, Calif. 94105. This special number examines notable aspects of Japan's current advances in the fields of fisheries science, technology, economic and geographic development. The editor says: "Long a leader in pelagic fisheries, as well as those of coastal character, the Japanese nation is a builder of fisheries and fishing vessels, an innovator in the engines and machines of fishing and fish packing; and at the same time stands in front rank of those who have devised highly sophisticated electronic instruments particularly for fisheries--and have applied them on and under the sea with signal success." Some of the feature articles, all written by members of the Japanese fishing industry and by Japanese press correspondents, are: "New Fisheries Techniques, Key to Man's Full Use of Resources"; "The Fish Finder, A Factor in Japan's Fishing Success"; "Japan's Distant-Water Trawlers, Special Design for Specific Ground Proposed"; "High Seas Minced Fish, A New Product of Immense Potential"; and several other articles on tuna fishing, cost-cutting techniques in new fishing methods, including gear and vessels.

--Norman B. Wigutoff

MARINE OILS:

"Fatty acid content of vegetable oils, unusual oils, marine oils, and margarines," by J. L. Iverson, article, *Journal of the Association of Official Agricultural Chemists*, vol. 48, Oct. 1965, pp. 902-904, printed, Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington, D. C. 20004.

MARINE RESOURCES:

A Study of the Marine Resources of the Merrimack River Estuary, Monograph Series No. 1, by William

C. Jerome, Jr., and others, 93 pp., illus., printed, June 1965. Massachusetts Department of Natural Resources, Division of Marine Fisheries, 15 Ashburton Place, Boston, Mass. 02208.

MASSACHUSETTS:

Annual Earnings of Boston Fishermen in 1964, Regional Report by Paul V. Mulkern, 19 pp., processed, Feb. 1966. U. S. Department of Labor, Bureau of Labor Statistics, 18 Oliver St., Boston, Mass. 02110.

Annual Report, Fiscal Year July 1, 1964-June 30, 1965, 95 pp., illus., processed, Sept. 1, 1965. Massachusetts Department of Natural Resources, Division of Marine Fisheries, 15 Ashburton Place, Boston, Mass. 02208. Discusses accomplishments of the Division of Marine Fisheries during the year ending June 30, 1965. Covers Marine Fisheries Advisory Commission meetings, contract dragging program, lobster research and management, shellfish research and management, estuarine research program, the coastal wetlands protection program, finfish studies, statistical needs committee, and legislation affecting marine fisheries. Includes statistical tables showing data on the lobster fishery; sea crab fishery; shore, net, and pound fishery; and Massachusetts landings of fishery products. Appendices contain information on "scrubbed" lobsters, uniform minimum legal length of quahogs, lobster and edible crab licenses for non-resident citizens, and other subjects.

MENHADEN OIL:

"Hypercholesterolemic effect of menhaden oil in the presence of dietary cholesterol in swine," by Eldon G. Hill, C. L. Silbernack, and W. O. Lundberg, article, *Proceedings of the Society for Experimental Biology and Medicine*, vol. 119, June 1965, pp. 388-370, printed. Proceedings of the Society for Experimental Biology and Medicine, Managing Editor, 630 W. 168th St., New York, N. Y. 10032.

MEXICO:

"Mexican government moves to diversify shrimp-dominated seafood industry," article, *Quick Frozen Foods*, vol. 17, Apr. 1965, p. 130, printed. E. W. Williams Publications Inc., 1776 Broadway, New York, N. Y. 10019.

MICROBIOLOGY:

Applied Microbiology, vol. 14, no. 2, Mar. 1966, 302 pp., illus., printed, single copy \$3. Waverly Press, Inc., 428 E. Preston St., Baltimore, Md. 21202. Contains, among others, articles on: "Effect of different commercial agar preparations on the inhibitory activities of phenols," by J. G. Sands and E. O. Bennett; "Biochemical differentiation of the *Enterobacteriaceae* with the aid of lysine-iron-agar," by Jane G. Johnson and others; and "Effect of γ -irradiation on the microflora of freshwater fish. I--Microbial load, lag period, and rate of growth on yellow perch (*Perca flavescens*) filets," by N. Kazanas and others.

NETHERLANDS:

"Le navire-usine 'Van-Gogh' construit aux Pays-Bas pur la Russie" (The factorship Van-Gogh built in the Netherlands for the U.S.S.R.), article, *La Pêche Maritime*, vol. 45, no. 1056, March 1966, pp. 191-195, illus., printed in French, single issue 15 F (US\$3). Les Editions Maritimes, 190, Boulevard Haussmann, Paris, France.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

NEW ENGLAND:

The Economics of the New England Fishing Industry: The Role of Technological Change and Government Aid, by Frederick W. Bell, Research Report, 221 pp., illus., processed, Feb. 1966. Federal Reserve Bank of Boston, 30 Pearl St., Boston, Mass. 02110. Investigates the economic development of the New England fishing industry in the postwar period; the economic feasibility of stern trawling to provide data for its possible adoption; and the impact of the 1964 Fishing Fleet Improvement Act on financing technological change.

OCEANOGRAPHY:

The Distribution and Characteristics of Surface Bioluminescence in the Oceans, TR-184 by Robert F. Staples, 54 pp., processed, Mar. 1966, 90 cents. U. S. Naval Oceanographic Office, Washington, D. C. 20390.

Oceanography, edited by Mary Sears, 665 pp., illus., printed, 1961, \$14.75. American Association for Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

"USSR Charts Pacific," by S. Osokin, article, Geo-Marine Technology, vol. 2, no. 3, Mar. 1966, pp. 22-24, illus., printed. INTEL, Inc., 1075 National Press Bldg., Washington, D. C. 20004. Soviet scientists have published an atlas, Relief of the Pacific Ocean Bed, which is an encyclopedia of the structure of the world's largest ocean, the Pacific Ocean. The atlas sums up and rationalizes the last 100 years of oceanographic and hydrographic research of that area.

PORTUGAL:

"Consumo Mundial de las Conservas de Pescado Portuguesas" (World Consumption of Portuguese Canned Fish), article, Boletín de Informacion, no. 86, Nov. 1965, pp. 8-9, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, Madrid, Spain.

"A Exportacao Galega de Conservas de Peixe em 1964" (Galician Exports of Canned Fish, 1964), article, Conservas de Peixe, vol. 20, no. 235, Oct. 1965, pp. 15-19, 28, printed in Portuguese. Sociedade da Revista Conservas de Peixe, Lda. Requeirao dos Anjos, 68, Lisbon, Portugal.

PROCESSING:

"New shellfish processing plant features: Space, light, comfort," article, Pacific Fisherman, vol. 63, July 1965, pp. 11-12, printed. Pacific Fisherman, Editorial Office, 71 Columbia St., Seattle, Wash. 98104.

PROTEIN:

"Characterization of a collagen from cod fish skin containing three chromatographically different chains," by Karl A. Piez, article, Biochemistry, vol. 4, Dec. 1965, pp. 2590-2596, printed. American Chemical Society, 1155 16th St., NW., Washington, D. C. 20036.

PUERTO RICO:

Taxonomía, ecología y valor nutricional de algas marinas de Puerto Rico (Taxonomy, ecology, and

nutritional value of marine algae of Puerto Rico: agar-yielding algae), by M. Diaz-Piferrer and Celeste Caballer de Perez, 145 pp., printed in Spanish, August 1964. Administracion de Fomento Economico, Laboratorio de Investigaciones Industriales Hato Rey, Puerto Rico and Colegio de Agricultura y Artes Mecanicas, Universidad, Mayaguez, Puerto Rico.

RADIATION:

Articles from Chemical Abstracts, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006:

"Changes in the composition of fatty acids of fish fat due to radiation," by A. A. Fomin, vol. 61, Oct. 26, 1964, Abstract No. 11241b.

"The effects of a few radioactive substances on oxygen consumption of shellfish," by Jutoku Hasegawa, vol. 62, Feb. 1, 1965, Abstract No. 3129e.

RED TIDE:

The Red Tide, by John Torpey and Robert M. Ingle, Educational Series No. 1, 27 pp., illus., printed, 1966. Florida Board of Conservation Marine Laboratory, Maritime Base, Bayboro Harbor, St. Petersburg, Fla.

REFRIGERATION:

"Analyze major problem in use of air curtains," article, Frosted Food Field, vol. 38, Mar.-Apr. 1965, p. 8, printed. Frosted Food Field, 321 Broadway, New York, N. Y. 10007.

SALMON:

"Protein variations in Atlantic salmon (*Salmo salar*)," by L. Nyman, article, Chemical Abstracts, vol. 63, Oct. 11, 1965, Abstract No. 10357f, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

SEAGRASS:

Preliminary Study of Seagrass as a Potential Source of Fertilizer, by Jack F. van Breedveld, Special Scientific Report No. 9, 26 pp., illus., processed, Jan. 1966. Florida State Board of Conservation Marine Laboratory, Maritime Base, Bayboro Harbor, St. Petersburg, Fla.

SEA NETTLES:

"A new attack on sea nettles," by Edison T. Blair, article, The Maryland Conservationist, vol. XLIII, no. 1, Jan.-Feb. 1966, pp. 16-22, illus., printed, single copy 25 cents. The Maryland Conservationist, State Office Bldg., P. O. Box 231, Annapolis, Md. 21404.

SHARK:

"Blåhaien, *Prionace glauca* (Linnaeus), 1758" (The blue shark), by Olav Aasen, article, Fiskets Gang, vol. 8, February 24, 1966, p. 142, illus., printed in Norwegian. Fisheridirektoratet, Rådstuplass 10, Bergen, Norway.

SHRIMP:

"Program for Gulf would study shrimp landings fluctuations," article, Fishing Gazette, vol. 82, June 1965, pp. 50-51, 73, printed. Fishing Gazette Publishing Corp., 461 Eighth Ave., New York, N. Y. 10001.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"The refractive index of the muscle of fish and shell-fish. II. Measurement of changes in the muscle of cold-stored prawns, *Nephrops norvegicus*," by M. K. Elerian, article, *Journal of the Science of Food and Agriculture*, vol. 16, no. 12, December 1965, pp. 738-742, illus., printed, single issue £1 17s. 6d. (US\$5.25). Society of Chemical Industry, 14 Belgrave Square, London, S.W.1, England.

"Salt transport organelle in *Artemia salinis* (brine shrimp)," article, *Science*, vol. 151, no. 3709, Jan. 1966, pp. 470-471, illus., printed, single copy 35 cents. American Association for Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

SOUTH AFRICA REPUBLIC:

Fisheries Development Corporation of South Africa Limited, *Annual Report* (Covering Period 1st October, 1964 to 30th September, 1965), 16 pp., printed in Afrikaans and English, March 16, 1965. Fisheries Development Corporation of South Africa Ltd., Seafare House, 68 Orange St., Cape Town, Republic of South Africa. An annual review of the corporation's financial condition and activities, including summaries of the state of the inshore fisheries for anchovy and pilchards; production of fish meal and oil, canned fish, cooked and live spiny lobsters, frozen lobster tails, and frozen whole lobsters; and activities of the corporation in anchovy, shrimp, tuna, whale, and oyster investigations, construction and maintenance of fishing harbors, and related areas of interest.

SPAIN:

Articles from *Industria Conservera*, vol. 31, no. 317, Nov. 1965, illus., printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain:

"Tecnica Conservera--Conservas de Sardina, Bonito y Anchoa" (Canning Method--Canned Sardines, Bonito, and Anchovy), pp. 306-308.

"El Mercado Aleman de Productos de la Pesca" (The German Market for Fishery Products), pp. 312-313.

Articles from *Industrias Pesqueras*, printed in Spanish. Industrias Pesqueras, Policarpo Sanz, 21-20, Vigo, Spain:

"El Mercado Espanol del Pescado" (The Market for Fish in Spain), vol. XXXIX, no. 925, Nov. 1965, pp. 496-497, illus., printed.

"La produccion pesquera de Vigo en 1965" (Vigo's Fishery Production, 1965), vol. XL, no. 930, January 15, 1966, pp. 608-609, illus., printed.

SPAIN & PORTUGAL:

"Coup d'oeil sur la pêche espagnole et portugaise" (A look at the Spanish and Portuguese fisheries), by Peter Brady, article, *La Pêche Maritime*, vol. 45, no. 1056, March 1966, pp. 171-177, illus., printed in French, single issue 15 F (US\$3). Les Editions Maritimes, 190, Boulevard Haussmann, Paris, France.

SPINY LOBSTER:

"Methods of holding crayfish at sea," by L. A. Randall, article, *Australian Fisheries Newsletter*, vol.

25, no. 4, April 1966, pp. 19, 23, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, A.C.T., Australia.

SWEDEN:

Articles from *Svenska Vastkustfiskaren*, printed in Swedish. George Åberg, Fiskhamnen, Goteborg V, Sweden:

"Utsiktarna för fisket under 1966-1970" (Outlook for the fisheries in 1966-1970), by Ingemar Gerhard, vol. 36, no. 3, February 10, 1966, pp. 52-53.

"Fangsterna minskade - pengarna ökade i svenskt havsfiske år 1965" (Volume of the catch decreases--value increases in Swedish sea fishery, 1965), vol. 36, no. 5, March 10, 1966, pp. 100-101.

SWITZERLAND:

"The Swiss market for selected seafoods," article, *Indian Seafoods*, vol. III, no. 2, 1965, pp. 11, 14-16, printed in English. The Marine Products Export Promotion Council, Mahatma Gandhi Road, Ernakulam-6, Kerala State, India.

TAIWAN:

"Further Development of Fisheries in Taiwan," K. T. Li, article, *Industry of Free China*, vol. XXV, no. 3, March 1966, pp. 18-25, printed in English, single issue NT\$20.00. Industry of Free China, 118 Huai Ning Street, Taipei, Taiwan.

TRANSPORTATION:

"How expensive is it to operate a nitrogen FF (frozen food) delivery fleet?" by Arthur Gaudio, article, *Quick Frozen Foods*, vol. 17, Apr. 1965, pp. 161, 166, printed. E. W. Williams Publications, Inc., 1776 Broadway, New York, N. Y. 10019.

TRAWLING:

"Underwater observations on fish in an off-bottom trawl," by William L. High and Larry D. Lusz, article, *Journal of the Fisheries Research Board of Canada*, vol. 23, no. 1, January 1966, pp. 153-154, illus., printed, single issue C\$1.00. Issued by Fisheries Research Board of Canada, Ottawa, Ontario, Canada. (Sold by Queen's Printer, Ottawa.)

TUNA:

"Dati sulla pesca all'amo del tonno nello stretto di Messina" (Observations on the catching of tuna with hook and line in the straits of Messina), by Sebastiano Genovese, article, *Bollettino di Pesca, Piscicoltura e Idrobiologia*, vol. XX, no. 1, January-June 1965, pp. 41-51, illus., printed in Italian with English and French summaries. Laboratorio Centrale di Idrobiologia, Piazza Borghese 91, Rome, Italy.

TURKEY:

Balik ve Balikcilik, vol. 14, no. 1, Jan. 1966, 32 pp. illus., printed in Turkish. Et ve Balik Kurumu G. M., Balikcilik Müdürlüğü, Besiktas, Istanbul, Turkey. Among the articles included are "Seminar on fisheries economics in Turkey," and "Britain's present fisheries."

"1963-67 birinci bes yıllık kalkinma plani 1966 yili programi ve balikcilik" (The fisheries in 1966 program of the first five years development plan, 1963-1967, of Turkey), article, *Balik ve Balikcilik*, vol.

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XIV, no. 2, February 1966, pp. 1-3, printed in Turkish. Et ve Balık Kurumu G. M., Balıkcılık Müdürlüğü, Besiktas, Istanbul, Turkey.

UNITED KINGDOM:

New Era in Fishing (A Technical Review), Supplement to Fishing News, March 4, 1966, 40 pp., illus., printed. Fishing News, 110 Fleet Street, London, E.C. 4, England. Technical change in British fishing is the theme of this Supplement. Included are articles on the following subjects: freezer-trawler operation; what's new in trawling; changes in inshore vessels; making the sea safer; British trawler development; diesel engines for inshore craft; lubrication of trawler machinery; winches and deck gear; communications and fish-finding equipment; floats and bobbins; synthetic fibers for fishing; and plastics in the fishing industry.

Warp Load Meters for Seine Net Vessels, Research Development Bulletin, no. 17, 4 pp., illus., processed, Dec. 1965. White Fish Authority, 2/3 Cursitor Street, London, E.C. 4, England.

U.S.S.R.:

Articles from Okeanologiya, vol. 6, no. 1, 1966, printed in Russian, single issue 1 ruble & 50 kopeks (about US\$1.65). Okeanograficheskaya Komissiya, Akademia Nauk U.S.S.R., Moscow:

"A plankton net with a water-measuring arrangement. Its description and test results," by E. P. Bitukov, pp. 165-171, illus.

"37th cruise of Vitjaz in the central part of the Pacific Ocean," by V. P. Petelin, pp. 172-175, illus.

"The most recent foreign oceanographic research vessels," by V. L. Tsurikov, pp. 176-185, illus.

YEARBOOK:

The following yearbooks are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402:

The Population Challenge--What It Means to America, U. S. Department of the Interior Conservation Yearbook No. 2, 80 pp., illus., printed, 1966, \$1.25. U. S. Department of the Interior, Washington, D. C. Examines the problem of how the population explosion will affect one's life and the crucial decisions one must make to ascertain a livable environment in the years to come. Discusses among others, the problems of commercial fisheries in the United States today, and how the Bureau of Commercial Fisheries has been helping to solve them.

Quest for Quality, U. S. Department of Interior Conservation Yearbook No. 1, 96 pp., illus., printed, 1965, \$1.00. U. S. Department of the Interior, Washington, D. C. Among other things, discusses the Bureau of Commercial Fisheries' vast research program that spans continents and plumbs the depths of our greatest oceans. Special mention is made of the research to provide fish protein concentrate (known as FPC) to more than 2 billion people who do not receive enough protein to maintain a minimum balanced diet.



Editorial Assistants: Ruth V. Keefe and Jean Zalevsky

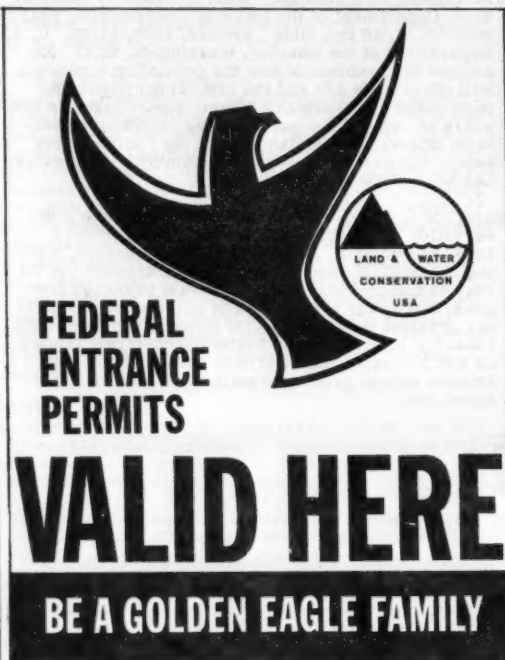
Compositors: Alma Greene, Mary Andrews, and Mary Donaldson

Photograph Credits: Page by page, the following list gives the source or photographer for each photograph in this issue. Photographs on pages not mentioned were obtained from the Service's file and the photographers are unknown.

P. 22--Edward Gruger; p. 32--Alaska Dept. of Fish and Game; p. 35 (fig. 1)--H. R. Bullis, Jr. p. 49--Consulate General of Japan, N.Y. p. 55--Info. Services, Dept. of Fisheries, Ottawa, Canada; pp. 63 & 64--A. W. Anderson, Regional Fisheries Attache for Europe, U.S. Embassy, Copenhagen, Denmark; p. 74--Peter Brady, Fleetwood, England; p. 75--R. S. Croker; p. 85--S. Springer; p. 87--Office of Information, Commission on Rural Construction, Taiwan; p. 91--Burmester & Wain, Denmark; p. 96 (fig. 2)--Charles L. Philbrook; pp. 97 & 98 (fig. 8)--R. C. Naab; p. 98 (fig. 5)--W. Haskell; p. 99 (fig. 10)--U. S. Coast Guard.

NEW \$7 FEDERAL "GOLDEN PASSPORT" ON SALE ACROSS THE NATION

The new \$7 Federal Recreation Permit--the "Golden Passport" of the Federal Government's Operation Golden Eagle--went on sale across the Nation March 25, 1966, announced the U. S. Department of the Interior. The wallet-size card was designated a "Golden Passport" because of its gold color and the large number of Federal recreation areas--7,000 of them--it entitles the purchaser and everyone in his car to enter.



Designates 7,000 areas where the \$7 Federal Recreation Permit--the "Golden Passport"--is valid.

use it on a commercial bus going into an area or when walking into an area or building. The 1966 permit is valid an unlimited number of times from April 1 through March 31, 1967. It does not cover special user charges, such as fees for guides, elevators, etc.

The annual permit is sold at national parks and monuments, national forest areas, wild-life refuges, Corps of Engineers recreation areas, and other Federal recreation areas that charge entrance fees. It also will be on sale in many cities at offices of the American Automobile Association, the Forest Service, National Park Service, Tennessee Valley Authority, Bureau of Sport Fisheries and Wildlife, and the Bureau of Outdoor Recreation.

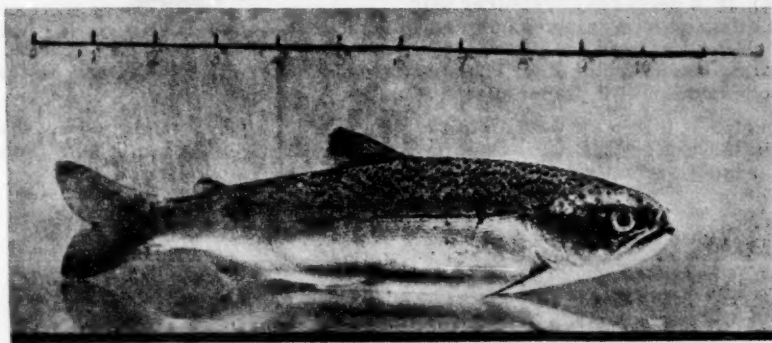
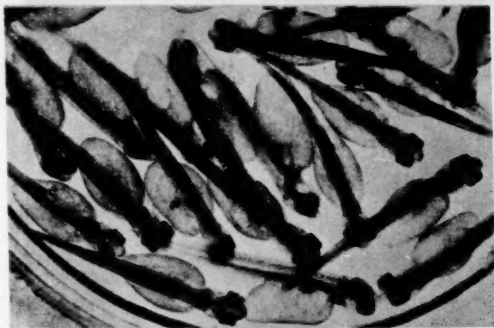
Secretary of the Interior Stewart L. Udall recommended wide citizen support for all phases of Operation Golden Eagle, but especially urged purchases of the \$7 "Golden Passport" to help provide support for the Land and Water Conservation Fund. "How much of the national outdoor heritage we save for future generations is largely dependent on how we today employ the skills and energy at our disposal. Congress wisely provided the means of saving much of what remains through passage of the Land and Water Conservation Fund Act," Secretary Udall stated.

The program to expand revenues of the Fund has attracted wide citizen support. Operation Golden Eagle was devised to provide a rallying point for marshalling support of the program in all the States and territories. Money from the sale of the "Golden Passport," together with other fees and revenues, goes into the Fund. Appropriations from the Fund assist States and their local governments in meeting urgent outdoor recreation needs and in the acquisition of Federal areas authorized by Congress.

Besides admitting a carload of people to Federal recreation areas, the \$7 "Golden Passport" will admit the purchaser himself, regardless of how he travels, to all Federal recreation areas that charge entrance fees. This means that the owner of the permit can

WEST COAST SALMON GROW UP IN MICHIGAN

Coho salmon have now been Michigan residents for one full year, and they are well on their way to a long sojourn in that State. The picture at left shows them as "eyed" eggs, when they arrived from Oregon in January 1966. A second batch arrived from the State of Washington in February 1966. Soon after being placed in rearing pens at Harrietta and Oden hatcheries, they changed to the "sac-fry" size with the egg sacs still attached, as

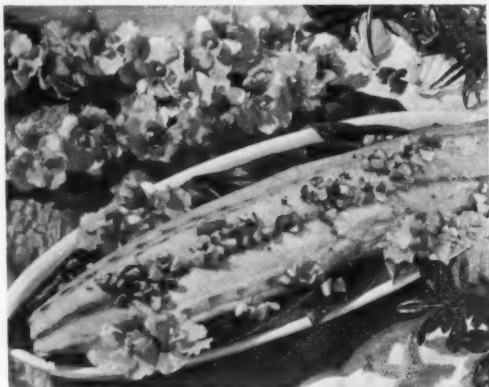


shown at right. Above, one of the fish as seen in February 1966, after a year in the hatchery, is about 10 inches long. First releases of the fish will be made in the spring of 1966 in the Platte River, Benzie County; in Bear Creek of Manistee County; and in Huron River, Baraga County. (Michigan Conservation, January-February 1966.)

HAWAII CALLS: ONO ONO MAHIMAHI

In October 1868, a mythical ship, Lucy S., arrived in Hawaii. On this mythical voyage, Lucy, the Captain's wife, an avid recipe collector, wrote a series of mythical letters to her cousin, Sarah, who remained in New Bedford. From these letters, the United States Department of the Interior's Bureau of Commercial Fisheries has announced a new collection of kitchen-tested recipes for today's busy homemaker.

Bring the exciting tang and exotic charm of the Hawaiian Islands to your table with Ono Ono Mahimahi (Delicious Dolphin).



Natives greet the whaler at Hawaii.

Dolphin (not to be confused with the playful porpoises), is a deep-sea adventurer with scales of changeable rainbow colors. It sprints through the water at nearly 50 miles an hour, leaving most fish behind. This warm-water favorite will go just as fast on your table too, because dolphin is flavorful and fanciful.

In this recipe it is broiled with a simple sauce of butter and lemon juice. When golden and flaky the fish is served with a subtle sauce featuring Macadamia nuts from Hawaii. Serve it often--you'll win a wave of compliments.

ONO ONO MAHIMAHI
(Delicious Dolphin)

2 pounds mahimahi fillets or other
fish fillets, fresh or frozen
1 teaspoon salt
Dash pepper

$\frac{1}{4}$ cup butter or margarine, melted
2 tablespoons lemon juice
Macadamia Nut Sauce

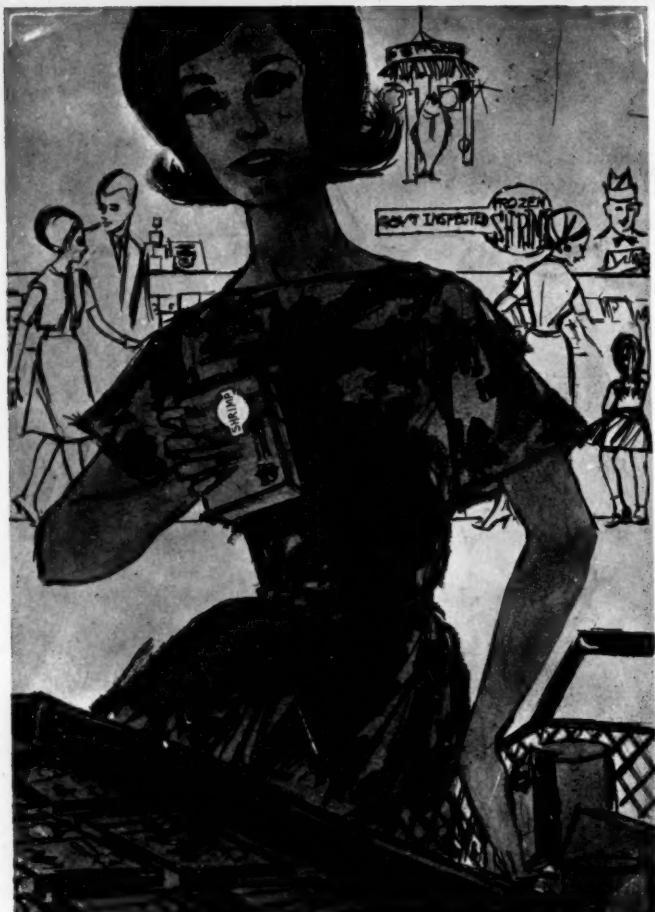
Thaw frozen fillets. Skin fillets and cut into serving-size portions. Sprinkle with salt and pepper. Combine butter and lemon juice. Place fish on a well-greased broiler pan and brush with sauce. Broil about 3 inches from source of heat for 4 to 5 minutes. Turn carefully and brush with sauce. Broil 4 to 5 minutes longer or until fish flakes easily when tested with a fork. Place fish on a warm serving platter. Pour Macadamia Nut Sauce over fish. Serves 6.

Macadamia Nut Sauce

1 cup Macadamia nuts, coarsely chopped
 $\frac{1}{2}$ cup butter or margarine, melted

1 tablespoon chopped parsley

Brown nuts in butter. Add parsley. Makes 1 cup sauce.



QUALITY BY CHOICE

Mrs. American Homemaker is selective when it concerns quality in food. She knows that fish and shellfish are one of the best foods available where good eating and high quality protein, mineral, and vitamin content are concerned. She chooses products which carry the United States Department of the Interior (USDI) Inspection Shield when she wants high quality frozen fish and shellfish.

The U.S.D.I. inspection is voluntary and is offered to industry on a fee-for-service basis. Only those fishery products that have been processed under continuous in-plant inspection and which meet definite quality, processing, and packaging requirements are permitted to carry this emblem and use the prefix "U. S." with a grade designation (such as U. S. Grade A) or the familiar U.S.D.I. shield.



